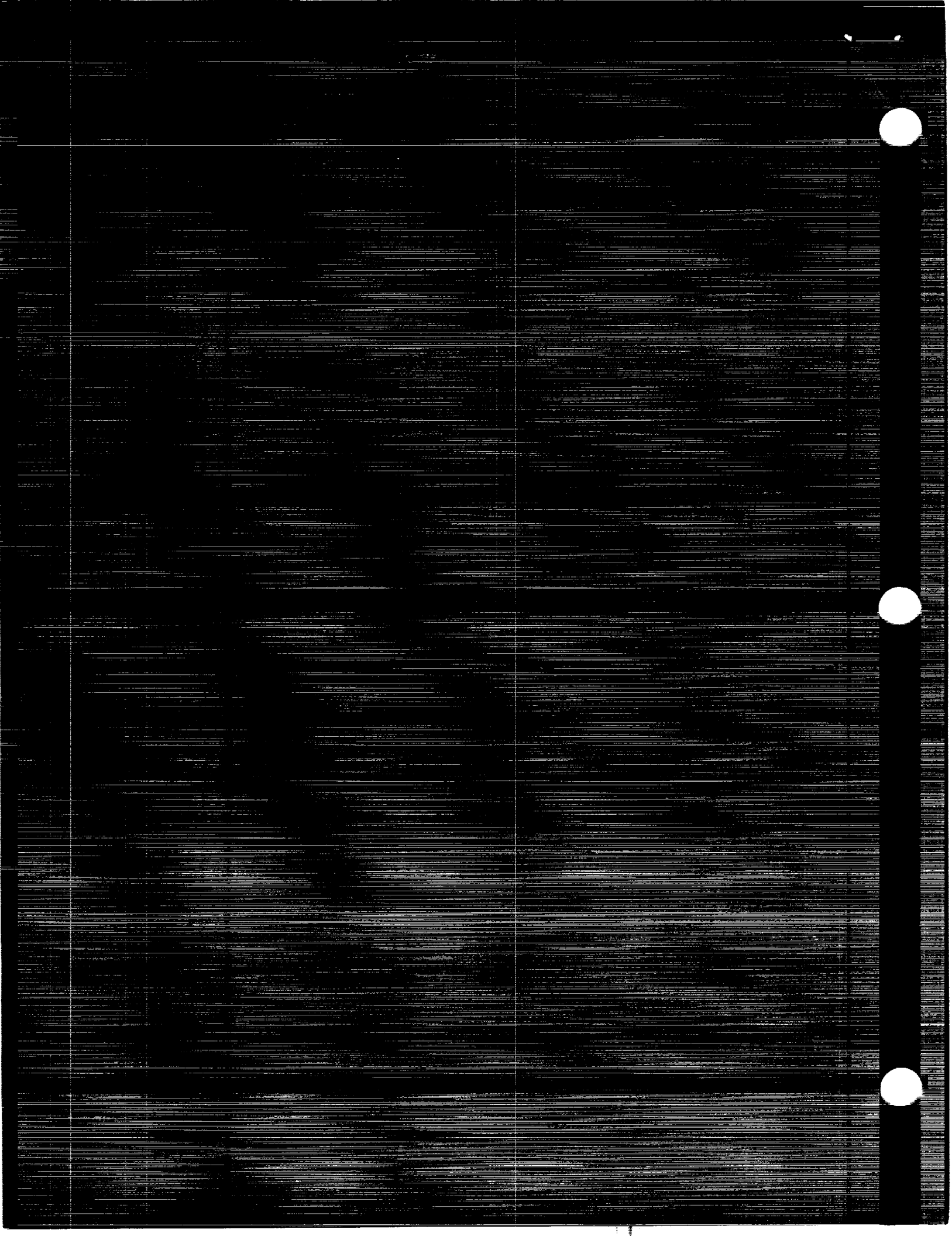
NHB 5300.4 (2B-1)

Quality Assurance Provisions for Delegated Government Agencies

NASA

National Aeronautics and Space Administration



PREFACE

This publication establishes requirements encompassing the broad scope of activity necessary for agencies or NASA representatives performing quality assurance functions for NASA. These requirements are designed to promote a uniform degree of compliance while making use of compatible existing Agency procedures.

NASA installations and NASA delegated Department of Defense (DOD) agencies shall utilize this publication in requesting quality assurance services.

For purposes of implementing NASA and other Government agency agreements, and to provide for uniformity and consistency, the terminology and definitions prescribed herein shall be utilized for all NASA quality assurance delegations and subsequent redelegations. This publication shall not be rewritten or issued in any other form. Any proposed deviations in terminology and definitions shall be submitted to the Director, Reliability, Maintainability and Quality Assurance Division, NASA Headquarters, for approval.

The nature of NASA research and development, aeronautical, and space programs requires that all practicable actions be taken by Government agencies, as well as by contractors/suppliers, to ensure the quality and reliability necessary for successful hardware development and mission accomplishment. Such achievement requires a thorough understanding of NASA quality assurance concepts, careful attention to detail, and technical knowledge and competence concerning the articles or services procured.

To facilitate timely execution of NASA programs, detailed implementation of the requirements set forth in this publication should be arranged between field representatives of the delegated Agency and of the procuring NASA Installation.

Comments and questions concerning the requirements set forth in this publication should be referred to the National Aeronautics and Space Administration Director, Reliability, Maintainability and Quality Assurance Division, Washington, DC 20546. However, questions concerning its application to specific procurement actions should be referred to the procuring NASA installation.

NHB 5300.4(2B), November 1971, is cancelled.

Milton A. Silveira
Chief Engineer

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ORGANIZATION OF THE R&QA MANUAL

OVERALL COVERAGE

The Reliability and Quality Assurance Manual - referred to as the "R&QA Manual" - is the overall generic title which identifies all NASA R&QA management publications published under the basic R&QA subject classification code. The publications are grouped by major subject breakdown and further divided into specific categories identified as Parts. These Parts (not a complete R&QA Manual) are published as individual R&QA publications.

The following list shows the grouping and R&QA publications:

Title

Volume 1 - General Provisions

Title	Number
Reliability Program Provisions for Aeronautical and Space System Contractors	NHB 5300.4(1A) (April 1970)
Quality Program Provisions for Aeronautical and Space System Contractors	NHB 5300.4(1B) (April 1969)
Inspection System Provisions for Aeronautical and Space System Materials, Parts, Components and Services	NHB 5300.4(1C) (July 1971)
Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program	NHB 5300.4(1D-2) (October 1979)

Volume 2 - Government Agency Provisions

Quality Assurance Provisions for Delegated Government Agencies	NHB 5300.4(2B-1) (June 1985)
Management of Government Quality Assurance Functions for Supplier Operations	NHB 5330.7 (April 1966)

Volume 3 - Standards

Requirements for Soldered Electrical Connections	NHB 5300.4(3A-1) (December 1976)
Qualified Products Lists Requirements for Microcircuits	NHB 5300.4(3F) (June 1972)
Requirements for Interconnecting Cables, Harnesses, and Wiring	NHB 5300.4(3G) (April 1985)
Requirements for Crimping and Wire Wrap	NHB 5300.4(3H) (May 1984)
Requirements for Printed Wiring Boards	NHB 5300.4(3I) (May 1984)
Requirements for Conformal Coating and Staking of Printed Wiring Boards Electronic Assemblies	NHB 5300.4(3J) (April 1985)
Design Requirements for Printed Wiring Assemblies	NHB 5300.4(3K) (Soon to be Released)

DOCUMENT REFERENCING

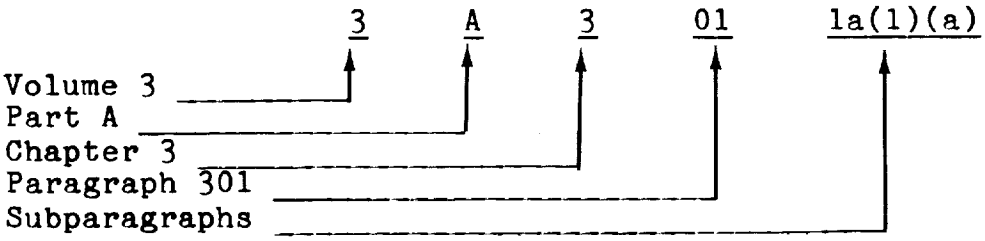
Each R&QA Manual Part is assigned its own identification number within the basic classification code. The numeric-alpha suffix within a parenthesis identifies the grouping of the publication, that is, the volume and part, such as NHB 5300.4(3A): This number indicates that this is the first "Standards" (Volume 3) publication to be issued.

When a part is revised, the suffix identification will be changed to indicate the revision number, such as NHB 5300.4(3A-1).

In referencing or requesting any R&QA publication, the complete specific NHB number must be used.

PARAGRAPH REFERENCING

The following shows the paragraph numbering systems applicable to all R&QA publications.



When it is necessary to reference an R&QA publication requirement (paragraph) in any NASA document, the specific NHB number and paragraph number must be used together as follows: "NHB 5300.4(3A-1), paragraph 3A301-1a(1)(a)," or "paragraph 3A301-2b of NHB 5300.4(3A-1)."

TABLE OF CONTENTS

CHAPTER 5: CHANNELS OF COMMUNICATION

APPENDIXES

CHAPTER 1: INTRODUCTION

2B100 GENERAL

1. This publication describes requirements for agencies or NASA representatives performing quality assurance (including inspection) functions for NASA contracts. The provisions herein will be used to determine conformance of contractor's items and services to NASA contract quality requirements.

2. The objective of this publication is to assist agencies in providing quality assurance services in an effective and uniform manner. Emphasis on various quality assurance provisions may vary due to the research and development and production nature of NASA contracts and the differences inherent in various projects and missions. Since much of the hardware produced for NASA is one-of-a-kind, quality assurance activities/provisions must be "preventive" in application.

3. This publication does not describe all of the detailed requirements for Agency quality assurance actions. In addition to this publication, the Agency shall use its existing administrative, operational, and procedural instructions and the technical documents cited in the contract or subcontract. In the event of conflict with Agency documents, this document as specified in the NASA letter of delegation shall take precedence. The NASA Quality Assurance Representative (QAR) and/or the delegating Agency shall be promptly informed of any conflicts or situations which interfere with performance of the delegated quality assurance functions.

4. Prompt identification of problems and timely, effective action is paramount for NASA programs. Problems which cannot be readily resolved shall be brought immediately to the attention of the NASA QAR and delegating Agency designated in the letter of delegation.

5. For definition of terms, see Glossary of Terms and Acronyms (Appendix A).

2B101 NASA REPRESENTATIVES

The NASA installation shall designate its NASA QAR for matters described in this publication. NASA technical representatives and NASA QAR's may be assigned to contractor plants as necessary to provide a direct liaison with NASA and to furnish technical guidance to the contractor and delegated Agency. The Agency and the contractor will be advised by letter from the contracting officer of the names of the NASA QAR's in addition to the names of other assigned NASA representatives. Any NASA direction that would alter the terms or conditions of the contract will be contained in a modification to the contract. Copies of contract modifications will be furnished to the Agency involved.

2B102 APPLICABILITY

1. General. This publication is applicable to all agencies or NASA representatives delegated quality assurance functions in-plant or on-site for NASA contracts and subcontracts thereunder (including interplant orders and research and development contracts) when and to the extent invoked by the cognizant NASA Installation or by its delegated Agency.

2. Letters of Delegation. Delegations for prime contracts will be made by letter from the contracting officer of the responsible NASA installation to the Agency. The letter of delegation will cite NHB 5300.4(2B-1); the extent to which it is to be implemented; supplementary requirements pertinent to that procurement; guidance on redelegation; and record retention requirements.

2B103 LETTERS OF REDELEGATION

1. The Agency shall select items and materials for Government Contract Quality Assurance (GCQA) redelegation and shall advise the NASA QAR prior to issuance of the redelegation for the purpose of obtaining NASA approval. This approval is not required when specific redelegation authority is granted by the delegation. To prevent redelegation delay, decisions to redelegate shall be made early in the Agency planning and contract review phase.

2. When an Agency is authorized to redelegate quality assurance functions to an Agency at the next lower tier of procurement, the delegating Agency shall instruct the lower-tier Agency, by letter, how and to what extent this document shall be implemented. The contractor's purchase documents shall not be used as a means of redelegation.

3. Redelegations shall include applicable portions of the delegation received by the Agency.

4. Detailed requirements shall be consistent with the criteria for GCQA set forth in paragraph 2B305-2.

5. The name and business telephone number of the assigned NASA QAR shall be included in all redelegations.

6. Prior to redelegation, the Agency shall determine that the lower-tier Agency can provide a sufficient number of experienced and competent personnel to perform the required functions. If this determination reveals that staffing may be inadequate, the NASA QAR will be notified, and the lower-tier Agency will be asked to supply the delegating Agency a plan for acquiring a sufficient number of experienced personnel.

7. The redelegating Agency shall provide the lower tier Agency with a copy of the subcontract with the letter of redelegation. The redelegating Agency shall furnish the NASA QAR with a copy of the redelegation upon request or as otherwise directed in the primary delegation.

2B104 RESPONSE TO DELEGATION/REDELEGATION

In response to each delegation/redelegation, the receiving Agency shall advise the delegating/redelegating Agency of acceptance in full, partial acceptance, or nonacceptance. In the event of partial acceptance or nonacceptance, the receiving Agency shall state its rationale for the action and the NASA QAR shall be advised of the action. When/if sufficient experienced personnel are not available to perform all required functions of the delegation in a timely manner, the Agency shall not accept a delegation/redelegation without notification to NASA and/or the redelegating Agency. The Agency QAR having primary responsibility for the execution of delegated/redelegated functions shall be

identified in the response. Copies of any coordinating guidance from the delegating Agency to the contractor shall be sent to the receiving Agency.

2B105 DOCUMENTS

The Agency shall obtain contractual specifications and standards, other than NASA documents, from the usual distribution points. NASA documents should be obtained from the NASA QAR or the installation concerned. NASA R&QA publications require the contractor to provide or make available to the Agency all pertinent contractual documents. The NASA QAR shall be notified immediately if documents cannot be obtained from normal sources.

2B106 RELATION TO SYSTEM SAFETY AND RELIABILITY REQUIREMENTS

1. General. The quality assurance provisions herein are intended to aid in achieving the required system safety and reliability of NASA procured items and services. Reliability and safety requirements will be contained in the contract or subcontract. Certain requirements herein, such as testing and Government-Industry Data Exchange Program (GIDEP) participation, may be considered common to quality assurance, safety, and reliability programs.

2. Testing. Qualification, protoflight, acceptance, reliability, safety, and life testing effort may be required, but may be identified separately in a given contract or subcontract. However, such testing has significant influence on the quality of the items or systems involved and is a source of design information to be used in planning Agency test monitoring actions (see paragraph 2B311-2).

3. Analysis. Reliability, maintainability, and safety analyses should be considered and utilized in the Agency's Quality Assurance Program.

4. GIDEP. When the contractor is required to participate in GIDEP, the Agency shall monitor the contractor's participation.

5. Parts and Materials. The Agency shall monitor the contractor's parts and materials programs.

CHAPTER 2: BASIC REQUIREMENTS

2B200 GENERAL

Within the areas delegated, the Agency shall be responsible for effective management of its personnel, functions, and assessment of accomplishments. The Agency shall determine and assure that:

1. Contractors and subcontractors establish and maintain effective quality assurance systems in accordance with applicable provisions of NASA R&QA publications or other R&QA/quality system requirements cited in the contract or subcontract.

2. Articles, documents, materials, software, and services for NASA programs conform to contract requirements.

3. The Agency quality assurance program in effect at the time that the delegation is issued is reviewed and adjusted (if necessary) to reflect new contract and delegation requirements.

4. Open lines of communications are established and maintained at all times with the NASA QAR and higher/lower-tier Agency representatives.

2B201 PLANNING FOR QUALITY ASSURANCE AND INSPECTION

1. Planning Conferences. Quality assurance planning conferences will be held when considered necessary by NASA or the performing Agency. At the initial conference, the Agency proposed plan of action shall be discussed, including any interim actions to be taken until the Agency plan is developed. Subsequent conferences may be scheduled to address changes and assure the continued effective management of the program.

2. Requirements, Status, and Skill Capability Review

   a. Contract Review and Planning

      (1) The Agency, immediately upon the receipt of a delegation/redelegation, shall review the contract, quality system plans, and other pertinent documents to ascertain the quality assurance and technical requirements imposed upon the contractor.

(2) The Agency shall document the review of each contract, delegation, and/or redelegation on a typical Agency contract review and planning document. The contract review and planning document shall include information on new operating procedures, proprietary processes, special process procedures review checklists, and appropriate reference to the mandatory characteristics selected (see paragraph 2B205-2a(3)). Contract modifications may require updating and resubmission of the Agency form.

(3) The completed Agency contract review and planning document shall be submitted to NASA or the delegating Agency with the Agency plan, or the initial quality status report as directed in this document (see paragraph 2B205-2a), or the letter of delegation. Results of preliminary review of contractural requirements and the contractor QA system by the Agency staff specialists or engineering personnel should be incorporated in the contract review and planning document.

(4) When any additional information or direction is needed to clarify the contract requirements or the delegation, or when there are deficiencies in the procurement data package, design or technical requirements, including quality and reliability requirements, request for clarification shall be forwarded to the delegating Agency on appropriate agency forms.

b. Quality Program or Inspection System Status. The Agency shall review the contractor's records, and include in the Agency contract review and planning document any deficiencies in the contractor's quality program and/or inspection system, or any program or system changes required to satisfy the procurement requirements. The information shall include current remedial action and progress regarding uncorrected system deficiencies, including any instances of delinquency in remedial or preventive action on the part of the contractor.

c. Planning of Skill Capability. The Agency is responsible for assuring that the required skills are available to properly execute the functions delegated and to determine acceptability of articles or services provided by the contractor.

2B202 AGENCY QUALITY ASSURANCE PLAN

1. General

a. Upon completion of the review process, the Agency QAR shall immediately begin documentation of the Agency quality assurance plan. An Agency plan shall be documented on major systems or complex items, regardless of whether it is required to be submitted in the delegation/redelegation letter, and shall be available on site for review. The Agency plan shall describe performance of the delegated quality assurance functions necessary to assure contractor conformance. The plan shall include the requirements set forth in subparagraph 2B202-3.

b. Varying technical requirements and the state of the art may influence acceptance or necessitate revisions. Repetition of details of Agency procedures is not desired. However, sufficient detail shall be provided to permit Agency and/or NASA evaluation of the adequacy, extent, and degree of Government quality assurance performance. NASA terminology as contained in this document shall be used in all plans and reports. When the Agency's quality assurance program document has been identified in the letter of delegation, any changes thereto shall be forwarded to the NASA QAR for approval. If there is a program impact, an amendment to the delegation shall be negotiated. Until approval is given, the Agency shall perform to the original plan.

c. The Agency's existing quality assurance program will be considered if: (1) it effectively covers the delegation requirements; and (2) a concise supplement is furnished to cover those NASA requirements different from the requirements of the Agency quality assurance program. When an Agency has a quality assurance plan approved by a previous delegation, only those revisions necessary to comply with the new delegation should be submitted to that same NASA installation or the same higher tier Agency.

2. Agency Plan Development and Revision

a. Agency personnel shall take the necessary action to assure that required contractor plans and operations are established and documented as soon as possible in order to facilitate preparation of the Agency plan and implementing procedures. Concurrent participation of Agency personnel with the contractor during development of contractor plans is encouraged. During the period of delegation, timely revisions of the Agency plan should be submitted.

b. The Agency plan shall be developed and submitted at the earliest possible time, particularly if work is proceeding in advance of the contractor's plan. It is recognized that all details, such as the exact work to be performed in each contractor area, may not be available at the time of initial plan submission.

c. When an Agency plan is not required, the Agency shall have a written record of contract review and planning actions as required by paragraph 2B201 and shall submit an initial Quality Status Report as required by paragraph 2B205-2a.

3. Contents of Agency Plan. The Agency plan shall include the following information:

a. Contract Review and Planning Document (see paragraph 2B201-2a)

b. Skill Capability (see paragraph 2B203)

(1) In large resident facilities, an in-plant organization chart showing the numbers, assigned stamp numbers, series and job titles of Agency personnel assigned to each shift and to be assigned to perform the delegated functions. In small plants and nonresident facilities, the name of the QAR and the immediate supervisor will suffice in lieu of an organization chart. In either case, the name, location, and business telephone number of the QAR and immediate supervisor are required.

(2) Time-phased schedule for development of skills.

(3) Names of qualified and/or certified personnel; functional areas for which they are qualified and/or certified; and courses completed, including location and dates.

(4) Government training schedule for skills determined to be necessary through the contract review. Submit a schedule for special NASA training when authorized by NASA contracting officer (see paragraph 2B203-2b) or a request for authorization when approved by the NASA QAR.

c. Agency Records and Reports (see paragraphs 2B204 and 2B205)

(1) Government form numbers and title for Agency records.

(2) Identify contractor forms or documents used for Agency records.

(3) Identification and frequency of reports.

d. Quality Assurance Operations (see chapter 3)

(1) Activities related to quality, reliability, and safety general requirements. Typical activities are:

(a) Observe, record, and report (paragraph 2B300-1).

(b) Solicit assistance (paragraph 2B300-2).

(c) Inform NASA QAR of problems with recommendations (paragraph 2B300-3).

(d) Provide independent assessments of subcontractors' documents (paragraph 2B300-4) and contractor's control of subcontractors.

(2) Identification and use of contractor, Agency, and NASA quality assurance documents including numerical controlled tapes (paragraph 2B301).

(3) Selection of Actions and Characteristics for Agency Quality Assurance (paragraph 2B302).

(4) Quality Status Stamping and Control (paragraph 2B303).

(5) Review of contractor procurement documents and controls (paragraph 2B304).

(6) Government Contract Quality Assurance (GCQA) (paragraph 2B305).

(7) Metrology Control (paragraph 2B306).

(8) Nonconforming Item and Material Control (paragraph 2B307).

(9) Receiving Inspection and Test (paragraph 2B308).

(10) Government-Furnished Property (paragraph 2B309).

(11) Fabrication Control (paragraph 2B310).

(12) Participation in and performance of tests and inspections (paragraph 2B311).

(13) Trouble, Malfunction, Failure, and Deficiency Feedback (paragraph 2B312).

(14) Preservation, Packaging, Packing, Marking, Handling, and Shipping (paragraph 2B313).

(15) Agency mandatory/surveillance plans for critical/special processes.

e. Procedures Review and Evaluation (see paragraph 2B401)

(1) Submit copies of Procedures Review Checklists for all special processes (see paragraph 2B310-3a(2)), proprietary processes (when permitted by contract), numerical and computer controlled machines or test equipment with appropriate annotated frequency cycle. Criteria column entries for evaluation indicated on appropriate forms shall be clear and concise to ensure proper interpretation and understanding of how the evaluation is conducted.

(2) Indicate other elements of procedures review and evaluation by title. Submission is not required except upon specific request from the delegating/redelegating Agency.

4. Submission of Agency Plan. The Agency for the prime contractor plant shall submit its own plan within the time specified to NASA QAR or to the individual named in the letter of delegation. The plan shall be revised, a revision number assigned and the revision submitted, as necessary, to keep pace with detailed development of the contractor's operations. The plan and its revisions shall be subject to NASA approval unless otherwise specified.

5. Determining Agency Plan Requirements on Redelegation

a. When GCQA is redelegated, the Agency shall determine the requirements for the lower-tier Agency plan submission. A quality assurance plan, subject to delegating Agency disapproval, shall be required from the lower-tier Agency when the higher-tier contractor effecting the procurement requires submission of a quality program or inspection plan from the subcontractor.

b. The delegating Agency shall ensure submittal of an Agency plan within the time specified and shall notify the lower-tier Agency of the adequacy of its plan. In many cases, a flowchart and a list of specific mandatory characteristics will suffice in lieu of a lower-tier Agency plan.

2B203 PERSONNEL AND STAFFING

1. Capability

a. The Agency shall assign sufficient qualified personnel to perform the delegated/redelegated functions. For effective performance of required quality assurance functions, a combination of highly skilled engineering (GS-800 series) and quality assurance specialist (GS-1900 series) personnel, as well as other technically skilled personnel, may be required.

b. Physical fitness is paramount in the performance of many functions, particularly where hearing and visual acuity requirements of special processes and documents demand corrected hearing and vision, including no color blindness.

c. To the extent possible, the Agency shall inform the NASA QAR of any proposed changes in personnel prior to effecting the change to ensure that schedule of replacement does not affect performance of delegated/redelegated functions.

d. NASA may provide personnel to assist or guide the Agency or to perform required functions which have not been delegated/redelegated. Their duties, authority, and responsibilities will be clearly identified to the Agency.

2. Training and Certification

a. The Agency shall ensure that its personnel are adequately trained and, as required, qualified, certified, and/or recertified in the technical requirements applying to NASA procurements, and in processing, fabricating, inspection, testing, and nondestructive evaluation (NDE) techniques.

b. Special NASA training authorized in writing by the NASA contracting officer in the delegation, or Agency requests for authorization, shall be arranged through the NASA QAR. Such special training, either by NASA or by selected contractors, is intended to supplement formal or on-the-job Agency training. In conjunction with the NASA QAR, the Agency shall establish a proposed training schedule for all personnel requiring training and certification in NASA requirements.

c. Reimbursement for special NASA training cost is only applicable when specifically authorized in writing by the NASA contracting officer.

3. Staffing

a. The Agency shall ensure that sufficient engineering and quality assurance specialist personnel are assigned for NASA work to adequately perform the delegated/redelegated functions.

b. In determining staffing requirements, the Agency shall consider the nature of the items (complexity and state of the art) and the mandatory assurance actions associated with the NASA procurement. Where necessary, staffing shall be

sufficient to accommodate contractor operations involving multiple shifts, extended work hours (flexitime), and scheduled or unscheduled overtime.

c. Information concerning the experience, capability, and training of Agency personnel selected to perform work for NASA shall be made available to the NASA QAR upon request. The number of personnel shown in the plan need not be limited to those personnel currently available. A time-phased schedule for human resources requirements, corresponding to the plant activities, shall be submitted or modified at least semiannually or more often when contractual changes so require. Information concerning individual skills and experience shall be included together with schedules for providing necessary NASA-compatible training or certification. This schedule shall reflect the time necessary to train, qualify, certify (as necessary), and familiarize personnel with NASA work prior to performance.

2B204 AGENCY RECORDS

1. General. Results of Agency quality assurance actions shall be recorded and made available to the NASA QAR or provided when requested. In addition, records shall identify problem areas with related remedial and preventive action.

2. Requirements

a. Agency actions shall be documented on applicable Agency and/or contractor records, unless otherwise specified. The records shall provide evidence that the Agency reviews, inspections, and tests have been performed. Actual numerical or observed results obtained by Agency independent inspections and tests shall be recorded when:

(1) The results do not agree with those recorded by the contractor; or

(2) Recorded results are considered necessary by the Agency; or

(3) Agency-recorded results are requested by NASA.

b. Agency quality assurance records shall be identified and traceable to the item, specific test or operation procedures, contract, and/or purchase document. When items are serialized, or carry specific identification under a controlled system (lot numbers and date codes), such identification shall be documented on QA records. NASA terminology such as "mandatory" and "other than mandatory" shall be used on QA records, agency plans, in lieu of Agency terminology.

c. When contractor records are used to indicate Agency actions, such records shall be identified in the Agency plan and/or Quality Status Report when a plan is not required for submission.

d. Agency personnel shall stamp only those characteristics actually verified, inspected, or tested by them in the contractor or Agency records. Records shall include problems and nonconformances, including the nature and probable cause of deficiencies, malfunctions, troubles and failures, and the corrective action taken. While the probable cause of every nonconformance may not be readily determined, the best judgment and facts available at the time of detection shall be recorded.

3. Retention of Agency Records

a. Agency generated records of tests and inspections at all tiers must be maintained for the same period of time as required by contract, subcontract, purchase order, or as specified in the delegation and/or redelegation. Upon completion of the delegated/redelegated functions, and if not otherwise directed, the records shall be forwarded for inclusion in the Agency file retention system with a notation indicating the NASA period of retention.

b. Agency record retention regulations do not have precedence over NASA record retention requirements.

2B205 AGENCY REPORTS

1. General. Agency reports shall be in narrative form, typed, or legibly written in ink. Distribution shall be made as indicated in the delegation. Those reports prepared by the Agency QAR shall have direct transmittal to ensure timely communication with the NASA QAR.

2. Quality Status Reports

a. Initial Quality Status Report. When an Agency plan is not required, or when required and will not be submitted within 30 days after receipt of delegation/redelegation, an initial report will be submitted within this timeframe. The report shall contain the following information:

(1) Copy of completed Agency Contract Review Document (see paragraph 2B201-2a), including status of contractor's quality program or inspection system (see paragraph 2B201-2b).

(2) Identification of Agency QAR and immediate supervisor location and business telephone number.

(3) Listing of NASA supplied or Agency selected mandatory actions and characteristics. Submit all completed special process procedures review checklists and observation records listing mandatory characteristics for special processes.

(4) Identify contractor records used to indicate Agency actions when appropriate.

b. Quality Status Report. The Agency shall prepare monthly or as required by the letter of delegation/redelegation, a summary narrative quality status report for each NASA procurement, identified by each prime contract number. Preprinted fill-in type reports are not acceptable. The report will address results or events which have an effect on status, performance, or quality of an item, and contractor or Agency performance. This report shall be submitted to the NASA QAR or to the redelegating Agency within 5 work days after the established or agreed to period ends. Additional distribution for status reports shall be as specified in the letter of delegation/redelegation. A report shall be prepared and submitted by each Agency redelegated quality assurance functions when and as required by the redelegation letter. (See Appendix C for sample typical report.) The length of each quality report will vary depending on the complexity of the item. A single report may be submitted to cover more than one delegation or

redelegation when reporting topics which are common to all delegations. However, for information peculiar to a given contract, separate addendum sheets should be used. The following are some, but not all, of the topics to be considered for the report:

(1) Areas of nonconformance or noncompliance with the requirements of the contract or purchase order, including quality or reliability system documents. Examples are: procurement reviews; drawings and specification reviews; process evaluations; certifications of personnel, equipment, and materials; fabrication process requirements; configuration control; remedial action taken or in process; and agreements reached.

(2) Applicable information on quality or inspection surveys or audits conducted by higher-tier contractors or Government agencies including the delegating Agency.

(3) Changes in the contractor's quality program or inspection system affecting the level or degree of inspection or testing performed by the contractor and/or by the Agency.

(4) Any significant changes to the Agency plan.

(5) Summary of Agency inspection and test results listed by quality assurance and inspection areas. Nonconformances shall be summarized by items, including the nomenclature, description of deficiencies, disposition made, and remedial and preventive action taken.

(6) Unauthorized use of advance or disapproved documentation by the contractor.

(7) Agency independent comments on contractor or Government-initiated remedial action which is considered unsatisfactory or may result in lower quality or reliability of delivered items.

(8) Total number of regular and overtime hours expended on each NASA contract during the reporting period. Hours expended during performance of reviews, audits, or support functions at the facility directly supporting the NASA procurement and cumulative staff hours expended to date on each NASA contract.

(9) Changes in projected Agency human resources commitments for work on NASA contracts in the next 3 months. Notification of any proposed transfer of assigned personnel.

(10) Problems previously reported which remain unresolved.

(11) Progress in completing scheduled training.

(12) Status of contractor-prepared quality program and inspection documents.

c. Quality Status Report Suspension. In cases of no Agency activity for a reporting period, the following procedures are applicable in lieu of the submission of the periodic quality status reports:

(1) When there is planned inactivity, i.e., production or test has been stopped for other than strike, fire, or similar situations, the last report preceding the recess period shall indicate the planned void in reporting and positively state the expected date for resumption of reporting. If the recess period extends beyond a 3-month period, reporting will be revised to at least once a quarter. Quarterly reports, even though there was no Agency activity, will be required to reiterate that reportable activity remains on indefinite suspension.

(2) Where cessation of activity cannot be identified to a specific period of time, and where the inactivity covers the whole reporting period, a single statement will be forwarded advising that "no actions were taken on the contract or purchase order (identify) for the reporting period due to ------" (state reason).

(3) The following shall remain reportable by telephone even during the suspension of formal periodic reports:

(a) Contractor and subcontractor labor strikes.

(b) Loss of key contractor or Government personnel.

(c) Changes in the contractor facility and/or process capability that may affect eventual resumption of services under NASA contracts. These changes may be planned and/or caused by flood, storm, and fire.

3. Problem/Failure Report. The Agency is required to ensure that the contractor submits a problem/failure report and notification as contractually required, and to advise the NASA QAR (and the initiator of the redelegation when applicable) by telephone within 24 hours of the Agency's discovery of:

a. Failures which occur during qualification/ protoflight tests and acceptance tests.

b. Events which may have a significant impact on schedule commitments, and cost considerations, such as, fires, explosions, gross contamination, dented tanks, and structural overstress.

4. Special Notification Reports. The Agency shall immediately notify the NASA QAR (and the initiator of the redelegation when applicable) by the most expeditious means, e.g., telephone or teletypewriter, of any situation which:

a. Requires consultation, advice, or direction, i.e., any unusual phenomena, occurrence, or difficulty the detection and correction of which is not specifically contained in the applicable requirements (see paragraphs 2B300 and 2B311-2f).

b. Indicates that items which have been delivered or are ready for delivery should receive further evaluation, inspection, or test.

c. Indicates that designs or procedures, although in compliance with current requirements, may compromise or reduce the quality, safety, or reliability of the item or system in its intended use. Reasons for such conclusions shall be included.

d. Agency comments on changes, waivers, and deviations, or occurrences which may result, or have a significant unsatisfactory impact on safety, reliability, quality, schedule, or cost considerations.

e. Work stoppages.

CHAPTER 3: QUALITY ASSURANCE OPERATIONS

2B300 GENERAL REQUIREMENTS

To ensure that documents, items, processes, and the quality system conform to the requirements of the procurement document, the Agency shall participate in design and project reviews and quality assurance activities, and perform and/or witness tests and failure analysis, during all phases of design, development, fabrication, processing, assembly, test, and packaging and shipping. The Agency shall:

1. Observe, record, and report immediately to the NASA QAR or Installation any unusual phenomena, occurrence, or difficulty the detection and correction of which is not specifically contained in the applicable requirements.

2. Coordinate with the contractor and solicit assistance from other Agency or NASA representatives to perform the necessary investigations and tests to resolve these conditions.

3. Notify the NASA QAR (and the initiator of the redelegation where applicable) of pertinent facts and recommendations regarding questionable or discrepant conditions in order to obtain a NASA decision. Upon determination of resolution through NASA channels, ensure actions are taken for the items or systems involved and ensure that pertinent drawings, specifications, other technical documents, procedures, methods, and techniques are changed to reflect any new requirements.

4. Provide independent comments and recommendations on contractor prepared documents.

2B301 QUALITY ASSURANCE DOCUMENTS

1. General. The Agency shall use the contractor's and its own quality assurance documents unless other documents have been furnished by NASA or the delegating Agency. When requested, Agency operating procedures shall be submitted to the NASA QAR or the delegating Agency. This does not include those procedures and instructions which are an integral part of the detailed fabrication documents.

2. Manufacturing Software. This includes automatic test equipment, numerical controlled tapes, and other automated manufacturing controls. The Agency shall, when delegated, establish control procedures for the contractor uses of software/firmware for fabrication, calibration, test, or inspection. The Agency procedures shall ensure that such software/firmware are validated, verified, and so certified by the contractor prior to use. When software/firmware are forwarded to a subcontractor, the redelegation shall contain a certification that the software/firmware is suitable for fabrication and/or acceptance. When no certification is available for contractor or subcontractor generated software/firmware, the Agency shall conduct a detailed first-item inspection and verification. The Agency shall maintain files of its and the contractor/subcontractor certifications. The certification shall be made available to NASA when requested. All certified software/firmware shall be subject to configuration change control, and each software/firmware item shall be uniquely identified. Detailed first-item inspections are required of hardware items produced, inspected, or acceptance tested by software/firmware controlled equipment. Software/firmware controlled inspection and test equipment shall be calibrated by methods which ensure end-to-end accuracy while being controlled by the software/firmware.

2B302 SELECTION OF ACTIONS AND CHARACTERISTICS FOR AGENCY QUALITY ASSURANCE

1. General Assurance Actions. Selection of Agency quality assurance actions and characteristics associated with safety, fabrication, processing, assembly, and test will be made by the Agency, the redelegated Agency, or NASA. Development of quality assurance actions will begin at the time of the delegation and be changed as necessary during the implementation period. In the process of selection, full consideration will be given to using the technical skills of the Agency, experience with the product, and the information/data from all available sources, including:

   a. Results of design, safety, drawing, specification, and technical document reviews.

   b. Contractor's reliability and system safety analyses.

c. Development, certification, qualification, and reliability tests.

d. Pertinent data provided by the delegating Agency or NASA.

e. Interface and interchangeability requirements.

f. Contractor's fabrication procedures and process controls.

g. Modification and retest of items.

2. Mandatory Assurance Actions. Mandatory assurance actions are those Agency quality assurance actions, selected by the Agency, the redelegated Agency, or NASA which are considered mandatory. They shall be established and remain in effect until they are changed by Agency and NASA agreement. These actions shall include engineering reviews, safety analyses, tests, and process/procedure evaluations and inspections as appropriate. The following operations shall be included as a minimum:

a. Qualification/certification/protoflight tests (highest level of quality test performed).

b. Acceptance tests and/or inspection of end items including readiness for test activity as specified in paragraph 2B311-1.

c. Acceptance tests and inspection of spares.

d. Preshipment review (data [documentation] package review, shipment readiness, and DD Form 250 Sign-off).

e. Inspection and test of repaired, reworked, or modified items.

f. Teardown, buildup, test, and inspection of Government equipment returned for overhaul refurbishment.

g. Assembly or test of critical characteristics not available for later inspection or observation.

h. Special processes and nondestructive test or evaluations.

i. Failure analysis.

j. Refurbishment of previously accepted items.

k. Review of history of item fabrication, inspection, test configuration, changes, and nonconformances.

3. Selection of Characteristics (Mandatory)

a. In the selection process, full consideration will be given to utilizing the technical skills of the Agency (including its engineers and staff specialists), experience with the product and the contractors, and the information/data from all available sources including:

(1) Design, safety, drawing, engineering, configuration, specification, and technical document reviews including the related documentation.

(2) Qualification/certification/protoflight tests.

(3) Reliability, maintainability, and system safety tests and analyses.

(4) Development, certification, qualification, and acceptance tests.

(5) Failure Mode and Effects Analysis (FMEA) and failure analysis.

(6) Interface and interchangeability requirements.

(7) Contractor fabrication procedures and process control instructions and design standards/manuals.

(8) Modification and repair actions.

(9) Nonconformance reports and contractor/ product history.

(10) Feedback from NASA or the delegating Agency.

(11) Critical item and critical characteristic lists developed by the contractor.

(12) Contractor quality assurance manuals and requirements, e.g., the quality plan.

b. Mandatory characteristics will remain in effect until changed by Agency and NASA agreement. Selected characteristics are those which can be measured, witnessed, evaluated, or observed, and, if defective or inadequately accomplished, could:

(1) Prevent the item from performing its intended purpose in the next higher assembly or as an end item; or

(2) Result in hazardous or unsafe conditions when fabricating, inspecting, testing, using, or maintaining the item in transit or in storage awaiting shipment.

c. Mandatory characteristics are subject to evaluation, inspection and/or test on each item, process or assembly. Sampling of mandatory characteristics (either supplied by NASA or selected by the Agency), except those involving destructive tests, is prohibited unless so stated/approved by NASA.

d. Mandatory characteristics selected by the Agency are subject to approval by the delegating Agency.

e. When the design is accomplished by NASA, the delegating Agency (normally NASA), will select the characteristics for mandatory assurance to be performed on each item. If special processes are developed at the contractor's plant during the implementation phase, the Agency shall select Agency mandatory characteristics.

f. If an item is to be refurbished, repaired, or in any way modified after having been subjected to mandatory Government inspection or witnessing, then the same mandatory activities shall be imposed again insofar as they are affected by the refurbishment, repair, or modification.

4. Characteristics "Other Than Mandatory." In addition to mandatory characteristics, the Agency will determine if other characteristics should be identified for Agency inspection or verification. Certain of these may be selected for mandatory assurance actions on a temporary basis, dependent upon quality data, trouble/malfunction experiences, or upon request of the NASA QAR. Agency quality assurance actions in this category may be reduced when the required degree of quality and adequate contractor controls are demonstrated by objective quality evidence. Sampling is permitted for "other than mandatory" assurance actions when appropriate.

5. Removal of Characteristics from Mandatory Category.

   a. When mandatory characteristics are: (1) provided by NASA or a delegating Agency; (2) an integral part of an approved Agency quality assurance plan; or (3) are furnished in a quality status report when an Agency plan is not required, removal will require prior approval from the NASA QAR or the delegating Agency, as appropriate.

   b. NASA or the delegating Agency will consider written requests for removal of mandatory characteristics when the Agency can demonstrate, by objective evidence, contractor maintenance of the required quality. In most instances, proper selection of mandatory characteristics should minimize such requests. Pending a decision on such requests, the Agency shall continue mandatory quality assurance actions on the original characteristics.

   c. Removal of mandatory characteristics, either Agency or NASA selected, will not require prior approval when deletion is the result of technical changes in product, fabrication, or processes.

6. Contractor Annotation of Mandatory Characteristics. The Agency shall provide written notification to the contractor identifying the mandatory characteristics, and shall establish a requirement that the contractor annotate fabrication, assembly, test, and other operational documentation with the appropriate mandatory assurance points and hold points.

7. Mandatory Assurance Implementation

   a. The Agency will ensure that the Government quality assurance personnel perform all assurance actions on each item, procedure, and operation which have been identified as mandatory. Inability of the Agency to meet this requirement shall be made known to the NASA QAR immediately.

   b. When the nature of the assurance action precludes physical hands-on performance of an inspection/test by the Agency, the Agency shall witness the operation being performed by the contractor and observe the measurements on test equipment to determine whether or not the characteristics are within specifications.

   c. Under no condition shall an Agency QAR stamp off as acceptable any characteristic which has not been personally measured, witnessed, or observed. If a characteristic is inadvertently omitted or overlooked by the QAR, and it is not advisable to repeat the operation, the contractor's records and the Agency records shall indicate this omission with the appropriate written notation. Prompt notification shall be made to the NASA QAR of the problem and the incident shall be included in the Agency's Quality Status Report.

8. Independent Performance of Mandatory and Other Than Mandatory Inspections and Tests. The Agency shall independently perform inspections/tests after contractor personnel have made their inspection/test acceptance decisions, except in those cases where concurrent inspections/tests are necessary due to excessive costs, excessive time involved, or destructive testing.

2B303 QUALITY STATUS STAMPING AND CONTROL

1. Contractor Stamps. The Agency shall ensure that the contractor establishes and maintains a stamp control system commensurate with the contract requirements. Contractor stamps having the same shape as NASA stamps shall be considered acceptable providing the designation within the stamp does not include the notation "NASA."

2. Agency Serialized Stamps

a. General. Agencies with established procedures for usage and control of assignment to quality assurance representatives shall use their serialized stamps for NASA delegated functions.

b. Application

(1) Agency serialized stamps shall be applied directly to Agency-inspected item(s), unless it is impractical or prohibited by the letter of delegation. Stamp impressions shall also be used and dated on pertinent documents to indicate Agency inspection and test of selected characteristics. Stamps shall not be applied to items in a manner which may degrade the quality of the items. Steel stamps shall not be used for NASA delegated functions.

(2) Stamp ink shall be nonflammable, nontoxic, nonoutgassing, and compatible with components, systems, fluids, gases, or propellants in the expected environments. If it is not known whether the ink exhibits these characteristics, tests shall be performed or the delegating Agency shall be contacted to determine if prior knowledge is available.

(3) When items are not stamped, stamps shall be applied to tags, cards, labels, or other records associated with the individual items. In the case of extremely small parts, the inspection card, tag, or label shall indicate the status of all parts in the container.

(4) Stamp impressions shall be legible and shall not interlock with those of contractor stamps.

2B304 PROCUREMENT CONTROL

1. The Agency shall establish a system for the review of contractor procurement documents and controls over procurement sources. The review shall ensure, as a minimum, that:

a. All necessary quality, item usage, and technical requirements are complete, clearly defined, and accurately reflect contract requirements.

b. Applicable documentation is referenced and special documents provided.

c. The Government Source Inspection Clause, NHB 5300.4(1B), paragraph 1B502-2c(11), NHB 5300.4(1D-2), paragraph 1D503-3k, or NHB 5300.4(1C), paragraph 1C302-3k, is included whenever source quality assurance is authorized by the Agency; or, the "right to inspect" clause, NHB 5300.4(1B), paragraph 1B502-2c(12), NHB 5300.4(1D-2), paragraph 1D503.3(1), or NHB 5300.4(1C), paragraph 1C302-31, is included for procurements which do not require Government source quality assurance.

d. Contractor source quality assurance is required as necessary.

e. When contractor quality program or inspection plan is required to be prepared, submission is appropriately specified.

2. Qualified quality assurance personnel shall be assigned to review procurement documentation prior to issuance by the contractor. Such personnel shall be knowledgeable regarding the type(s) of procurement involved, e.g., hardware, software, special processes, and fabrication operations to be performed by the subcontractor/supplier.

3. Each contractor procurement shall be reviewed without exception.

4. Procurements for standard items, e.g., off the shelf or Qualified Product List (QPL), for which the contractor has end item use design responsibility for the item's critical characteristics or for modification or selection of the procured items, shall be included in the Agency review.

5. Upon determination that the contractor's procurement system is operating satisfactorily, the degree of review may be adjusted according to the previous quality history of the items being procured, the current effectiveness of the contractor's system, the complexity, and the end use of the items.

6. Procurements are from subcontractors which have been selected and approved per the contract requirements.

2B305 ARTICLES SUBJECT TO GOVERNMENT CONTRACT QUALITY ASSURANCE (GCQA)

1. Responsibility. Determination of the need for GCQA at subcontractors is the responsibility of the Agency and shall be made as early as possible in the procurement cycle (see paragraph 2B104). To facilitate early Agency determination and to avoid delays in the procurement cycle, the Agency shall:

   a. Review preliminary purchase documents prior to contractor negotiations with potential subcontractors.

   b. Arrange approval of GCQA from NASA QAR (see paragraph 2B104).

   c. Advise the contractor of conditions for end item or services requiring GCQA.

   d. The Agency shall review procurement of items subject to GCQA and shall prepare the detailed instructions required for letters of redelegation. Source quality assurance requirements shall be reviewed periodically and adjusted as circumstances require. GCQA is not automatic for all purchased items or services. Each GCQA request shall be accompanied by a letter of delegation from the Agency.

2. Criteria. The criteria to be considered in determining the need for GCQA are:

   a. The items being procured are at such a level of assembly, require qualification testing, are of such a nature as to prevent actual verification at the procuring contractor's plant of characteristics which are critical to the operation of the end item or are items classified as functionally critical.

   b. Special inspection or test equipment, measuring devices, or test environments are not available at the procuring contractor's plant to verify the characteristics of the item as required by the quality assurance documents.

c. Procurements for items for which the subcontractor has design responsibility which contain critical characteristics or accomplishes modification and selection.

d. Fabrication processes whose quality cannot be judged at a later time.

e. Marginal past performance or quality history of the subcontractor when conditions preclude procurement from other sources.

f. The Agency has been requested by NASA to require that certain items be subject to Agency source quality assurance.

g. Articles or materials designated for direct shipment from source to the procuring NASA installation or using site.

h. Government property or components thereof being returned to a contractor for repair, rework, retrofit, modification, test, teardown and evaluation, failure analysis, retest, cleaning, or having other special quality assurance requirements.

i. Effectiveness of contractor or subcontractor source quality assurance.

2B306 METROLOGY CONTROL

1. General. The Agency shall ensure that the contractor uses a documented metrology system that controls measurement processes and provides objective evidence of quality conformance. The system shall ensure that measurement standards and equipment are selected and controlled to meet the requirements of the NASA contract. The requirements as outlined in NHB 5300.4(1B), Chapter 9, NHB 5300.4(1D-2), paragraph 1D507, and NHB 5300.4(1C), paragraph 1C310 are to be used as guidelines where applicable. In addition, DOD Handbook H52, "Evaluation of a Contractor's Calibration System," should be utilized as a guideline document.

2. Metrology Procedures Review and Evaluation. Agency procedures review and evaluation should include, as applicable, the following system elements:

a. Special measurement standards and equipment, e.g., automatic test and checkout equipment.

b. Article or Material Measurement Process.

c. Calibration Measurement Process.

d. Traceability to National Bureau of Standards.

e. Handling, Storage, and Transportation.

f. Identification and Labelling.

g. Calibration Intervals.

h. Recall System.

i. Calibration Records.

j. Environmental Requirements, e.g., environment at calibration laboratory and at actual test locations of items or materials.

k. Remedial and Preventive Action.

3. Criteria for Evaluation

a. Criteria for procedure evaluation will include appropriate verification of actual calibration of measuring and test equipment to determine the validity of contractor's records and total metrology program. The availability of records consisting of checkmarks on data sheets or cards, properly dated calibration labels, or other means of identification do not constitute compliance with NASA metrology program requirements. In addition, calibration labels should not appear on instrument containers but on the actual instrument wherever practical.

b. The Agency shall ensure that contractor's records reflect calibration values to provide a history of equipment stability for the adjustment of calibration intervals and to provide objective evidence regarding the accuracy of measuring and test equipment used.

c. When NASA contracts and documents contain other additional requirements peculiar to NASA, these shall be included in the procedures review and evaluation.

4. Compatibility at All Levels. The Agency shall ensure that the receiving and producing contractor's measuring and test equipment and test procedures are compatible. This is especially important where measurements are pushing the state-of-the-art and it is not possible to secure and calibrate against standards having a tolerance less than 10 percent of that allowable for the equipment being calibrated. Where suitable national standards do not exist, the Agency shall ensure that the contractor consults the delegating Agency or the NASA representative to determine what standard should be used.

2B307 NONCONFORMING ITEM AND MATERIAL CONTROL

1. General. NASA procurements are tailored to the NASA program/project; therefore, Material Review Board (MRB) authority is not automatic and is not applicable as an Agency function unless specifically authorized in the letter of delegation/redelegation.

2. Agency Membership. When MRB authority is delegated to the Agency, the Agency shall designate its representative(s) and provide the name(s) to the delegating Agency. The Agency representative(s) assigned to the Board shall be subject to approval by the NASA QAR or the delegating Agency. In questionable circumstances and those involving critical items, the representative(s) shall call upon technical specialists of the Agency or of NASA. Agency MRB representatives shall be selected on the basis of technical competence to make decisions and commitments necessary to achieve effective preventive and remedial action and appropriate disposition for the item involved. The Agency shall submit to the delegating Agency a resume of the education, work experience, and background for each individual assigned this responsibility.

3. Material Review Board (MRB) Operation

   a. The Agency shall ensure that the contractor complies with the established contract requirements for processing nonconforming material. MRB actions and records should be identifiable to the particular items involved by a suitable contractor MRB identification. All nonconforming material shall require MRB action, unless otherwise specified in the contract, except material in the categories of:

(1) Return for rework to drawing or completion of operations.

(2) Obvious scrap.

(3) Return to subcontractor.

b. Nonconformances which adversely affect safety, health, reliability, durability, performance, interchangeability of parts or assemblies, weight, or the basic objectives of the contract require contracting officer approval.

c. Agency comments and recommendations shall accompany contractor's requests for approval. The Agency shall also advise the NASA QAR of MRB decisions concerning other nonconformances which reasonably can be expected to affect contract costs.

4. Return for Rework or Completion of Operations. If the nonconformance is in the category of "return for completion of operations" or "return for rework to drawings, specifications, or procedures," the item or material shall be reworked or completed using established technical documents and operations. During such rework, the item or material shall be resubmitted to normal inspection and/or test operations.

5. Repair. When, in the opinion of the MRB, an acceptable repair is possible, repair action may be authorized. Procedures shall be established and approved by the MRB to perform this repair. Contractor and Agency procedures shall include appropriate inspections and tests to verify the acceptability of the repair. Special attention shall be given to the selection and application of contractor repair procedures to ensure that those used are suitable for the item's intended use and environments. The NASA QAR shall be consulted as necessary.

6. Agency MRB Action. Within delegated authority, the Agency representative on the MRB shall:

a. Determine, on receipt of nonconforming material, whether the material is that for which the MRB is authorized to make final disposition or that requiring approval by the contracting officer.

b. Identify and evaluate all material submitted.

c. Determine or recommend disposition in accordance with Government approved MRB procedures. (For guidance, see NHB 5300.4(1B), paragraph 1B804-3.)

d. Provide results of MRB evaluation and recommendations when approval of the contracting officer is required.

e. Approve or recommend approval of the method and procedure for repair.

f. Follow up to ensure that pertinent document changes and final disposition are made as determined by the MRB and that disposal of scrapped items is appropriate.

g. Ensure that the contractor initiates prompt and effective action on nonconformances to prevent recurrence. Periodically review records for nonconformances to determine the effectiveness of the contractor's preventive action system.

h. Ensure that the contractor develops and maintains a system for recording all action taken on nonconformances.

2B308 RECEIVING INSPECTION AND TEST

1. General. Items and materials procured shall be inspected or tested upon receipt by the receiving contractor. The Agency shall select characteristics for receiving inspection and test and shall consider the requirements, when applicable, such as those listed in subparagraph 2.

2. Reviewing Contractor's Receiving Inspection Activities. The results of the contractor's receiving inspection and test, including documentation, shall be reviewed by the Agency and verified in sufficient depth to determine:

   a. The adequacy, e.g., visual and functional, of the contractor's receiving inspection.

   b. The quality of the items.

   c. Whether the items were damaged in transit and if the results of previous inspections should be voided due to contractor or Agency receiving and handling operations.

d. Whether adequate protective packaging was reapplied to maintain item quality through subsequent operations of handling, storage, and processing.

e. Whether deficiencies were previously overlooked or authorized by either the source or the receiving contractor.

f. Whether deficient items are physically separated, properly identified and controlled in a storage area for early MRB disposition or other corrective action.

g. That the receiving and producing contractor's measuring and test equipment are compatible (see paragraph 2B306-4).

h. That the article is functionally adequate to be installed in the next higher assembly.

3. Agency Receiving Quality Assurance Activities. When the Agency performs receiving inspection and procedure evaluation, the following criteria shall be considered in selecting characteristics for inspection and control:

a. That approved/qualified subcontractors and appropriate specifications were used.

b. That procured items and materials indicate evidence of quality assurance actions performed by the subcontractor and contractor in accordance with purchase requirements and are accompanied with required inspection, build history, certification, and test data.

c. That items and materials or accompanying records exhibit evidence of subcontractor, contractor, and GCQA as required.

d. That subcontractor inspection and test data are acceptable by conducting inspection and tests of selected characteristics. Particular emphasis shall be placed on those characteristics for which nonconformances may not be detected during subsequent inspection and test. Inspections and tests shall be accomplished in accordance with established inspection and test procedures.

e. That periodic disassembly is accomplished if required by contract for more detailed verification of requirements.

f. That identification and data retrieval requirements have been met and are maintained, that all required data and records are complete and correct, and that items and materials can be directly related to applicable contractor records.

g. That appropriate inspection and test equipment and technical documents are available at the proper places and at the proper times to perform the tests and inspections.

h. That subcontractor records for items and materials having definite characteristics of quality degradation or drift with age and/or use indicate the date and test time or cycle at which useful life was initiated and the life or cycles used. The records shall be maintained and updated if life or cycle use occurs during receiving inspection activities. The receiving inspection system shall also ensure that the items and materials, when required, exhibit evidence of initiation of useful life, the life or cycles used, and the date and test time or cycle at which useful life will be expended.

i. That chemical analyses and physical tests are performed, when required by specification or drawing, on test specimens submitted with or sampled from purchased items.

j. That chemical analyses and physical tests are conducted on samples randomly selected from materials received.

k. That the quality status of items and materials is maintained during receiving inspection and test operations. This shall include physical separation and identification of items and materials according to the following categories:

   (1) Items and materials awaiting inspection or test results.

   (2) Conforming items and materials.

(3) Nonconforming items and materials.

l. That items and materials and their records clearly indicate their acceptance or nonconformance status when released from receiving inspection and test.

m. That released items are adequately controlled and protected for subsequent handling, storage, or use.

4. Validity of Data Provided by Subcontractor. The Agency shall ensure that contractors perform sufficient verification of physical, chemical, or other test data to determine the validity of data received with purchased items and materials when drawings and specifications include chemical and/or physical test criteria. When certifications and/or certificates of compliance are contractually authorized, the Agency shall ensure that the validity of such data is periodically verified by the receiving contractor using Agency-approved procedures for sampling testing, source inspection, and data analyses; the Agency, as a minimum, shall compare the actual test data with the applicable drawing or contract requirements.

5. Remedial and Preventive Action. The Agency system shall include in its operation procedures a review of discrepancies revealed on inspected items and shall ensure that the receiving contractor initiates corrective action with the subcontractor to prevent recurrence. When GCQA is involved, the Agency cognizant of the receiving contractor shall immediately notify the Agency cognizant of the supplier of discrepant material.

2B309 GOVERNMENT-FURNISHED PROPERTY

1. Agency Responsibility. The Agency shall participate in contractor inspections of Government-furnished property (GFP) upon receipt at the contractor's plant. Contracts may require functional testing of GFP upon receipt. If complex GFP can only be functionally tested after installation, appropriate action shall be taken to allow for such conditions.

2. Defective Government-Furnished Property. If Government-furnished property is defective, the Agency shall immediately feed back failure and deficiency data to the NASA QAR or cognizant NASA installation and the source Agency for corrective action. The Agency shall ensure that an accurate determination is made regarding cause and responsibility when Government-furnished property is determined to be defective during and subsequent to contractor receiving inspection. Any disassembly, repair, modification, return, or disposal of such property which is received in a condition not suitable for use shall be as directed by the Contracting Officer.

2B310 FABRICATION CONTROL

1. General. The Agency shall cover all phases of operations and develop appropriate checklists and/or operation procedures with clear and concise evaluation criteria. The Agency shall perform procedures review and evaluation, "mandatory" and "other than mandatory" inspections, tests, and other quality assurance actions deemed necessary to ensure conformance to contractual and technical requirements.

2. In-Process Inspection

   a. The Agency shall establish controls and perform all necessary quality assurance activities during fabrication, assembly, and tests. The extent, degree, and frequency of these actions shall be included in the Agency plan and shall be sufficient to provide a continuous evaluation of the contractor's performance and physical verification of the quality status of the items and materials. To the extent necessary for adequate evaluation, the Agency shall:

      (1) Verify items and materials released for fabrication or assembly to ensure proper identification, configuration, segregation, stores control, and quality status.

      (2) Perform physical inspection of contractor-accepted items and materials.

      (3) Record results of actual inspections performed.

(4) Witness or perform in-process, functional and operational tests, nondestructive tests, and special fabrication and process operations.

b. The Agency shall ensure early positive preventive and remedial action by advising the contractor and, when appropriate, the NASA QAR of any operations, controls, or nonconformances which may jeopardize quality or the safeguarding of the items.

c. Complex, limited life, and destructive or long duration tests conducted by the contractor may require concurrent participation by the Agency.

3. Control of Processes

a. Agency Responsibility

(1) The Agency shall ensure that the contractor, when contractually required, develops and maintains a defect-prevention program for the control of all processes.

(2) The Agency shall ensure that the contractor establishes control procedures as contractually imposed for those processes where uniform, high quality cannot be ensured by inspection of items alone. These contractor processes include, but are not limited to, cleaning and contamination, contamination control; metallurgical and chemical processes; metal joining processes; bonding processes; plastics application; plating and coating processes; and surface treating processes. In addition, processes such as, radiography, ultrasonics, liquid penetrant, and magnetic particle shall be controlled to ensure that the results indicate the item or material quality levels.

(3) The Agency shall identify periodic or mandatory inspections/surveillance over special/critical processes in the Agency plan and status reports.

b. Process Control Procedures

(1) All process control procedures and software shall be reviewed and evaluated against applicable processing requirements, including detailed performance and control provisions. The Agency shall ensure that the contractors describe the preparation of the processing equipment and materials; the preparation of the items or materials to be processed; detailed processing operations; conditions to be maintained during each phase of the process including environmental controls; the methods of verifying the adequacy of processing materials, solutions, fluids, equipment, environments, safety, and their associated control parameters; and the required records for documenting the results of process inspection, test, and verification.

(2) In the event the Agency is prevented from evaluating the contractor's proprietary processes in the performance of their delegated quality assurance requirements, they are to immediately notify the responsible NASA QAR. It is NASA's responsibility to ensure contractor control of those critical processes which will affect the conformance of the end item to contractual requirements.

c. Equipment and Personnnel Certification. The Agency shall ensure that contractors provide for the certification of equipment and personnel for selected processes. Records certifying that tests have been performed and the results of such tests shall be maintained. Equipment and personnel shall be recertified as indicated by the results of quality surveys, inspections, or tests, or when changes are made which may affect process integrity.

d. Unauthorized Changes. Changes in contractually approved parts, materials, fluids, processes, or other procedures shall not be accepted unless the change has specific approval from the procuring Agency's contracting officer. Violations shall be reported immediately to the NASA QAR.

4. Workmanship Standards. When authorized by the delegation, the Agency shall participate with the contractor in the selection and/or review of samples or visual aids of acceptable workmanship standards. The Agency shall recommend changes in standards to the NASA QAR when such changes, revisions, or replacement are considered necessary to reflect current requirements.

5. Fabrication Instructions. When authorized by the delegation, the Agency shall review and monitor the use of contractor-prepared fabrication instructions for assembly operations, process operations, tests, inspections, intraplant handling, and preparation for shipment. The purposes of the Agency review and monitoring are to ensure that the fabrication instructions:

   a. Specify adequate inspection points.

   b. Include or specify inspection instructions including data recording requirements.

   c. Specify tests and test procedures with methods to correlate hardware configuration with the test procedure revision.

   d. Identify safety concerns.

   e. Specify processes.

   f. Provide for control and recording of special environmental conditions needed for processes or fabrication operations (cure times, oven temperature, and humidity.

   g. Specify preparation of test coupons and process sample specimens.

   h. Specify special tooling.

   i. Identify and specify use of manufacturing and inspection aids.

   j. Specify use of audiovisual assembly equipment.

   k. Are clear and concise.

   l. Are used in the performance of fabrication/assembly/process operations.

   m. Are used as specified for inspection test.

2B311 TEST AND INSPECTION

1. General. Prior to end item test and inspection, the Agency shall ensure that all requirements for contractor fabrication, assembly, inspection, and test have been met and that the end item is complete, contains no unauthorized substitute items or materials and is ready for test and inspection. Test and inspection of the end item shall be conducted in accordance with test and inspection documentation required by the procurement document. Special attention shall be given to observations or problems not covered by the applicable documents. The Agency shall consider the need for additional contractor or Agency tests and inspections during this test phase. Where both Agency and NASA personnel are involved, the responsibilities of each will be defined in the delegation letter or separate correspondence, and Agency responsibilities will be reflected in the Agency plan. When final acceptance is not at the contractor's facility, the letter of delegation will define any Agency responsibility for interim acceptance and for support at the remote site where final acceptance occurs. Agency personnel are not permitted to waive any portion of a delegation requirement to witness the complete end item test without specific written authorization of the delegating activity.

2. Test Planning Instructions. The following criteria and instructions shall be used by the Agency in planning the operations for qualification tests, acceptance tests, design verification tests, and tests conducted on items which have been repaired, reworked, or modified:

   a. The item presented for testing must be of the configuration delineated by the latest contractual drawings and specifications unless otherwise authorized by NASA, or in the case of subcontracts, by the prime contractor.

   b. The hardware and software test procedures and plans used by the contractor must be approved in writing as required by contract.

   c. The test setup, including software, must be verified as being in accordance with test procedures.

d. Test equipment used in the performance of these tests must have verification of up-to-date calibration and must have been evaluated according to the requirements of the contract.

e. The Agency-selected mandatory characteristics in contractor tests conducted at a plant or private laboratory by the contractor and/or laboratory personnel shall be witnessed by the Agency to ensure the authenticity of test data. Whenever data are recorded on automated equipment or software/firmware, witnessing/monitoring shall be accomplished at start and completion of tests and periodically during tests.

f. If a test criterion is not met and the contractor proceeds with testing at its own risk, the Agency shall: (1) notify the contractor verbally (in writing as soon as possible) of the deficiency and that continued witnessing does not constitute government acceptance; (2) continue to witness the contractor's performance; (3) record the contractor's action; (4) list requirements (including documentation) that must be completed prior to verification of test results; and (5) notify the NASA QAR via telephone immediately, confirm in writing and await written direction (see paragraph 2B205-2c(4a)).

g. When an item(s) is returned to the supplier for repair, modification, or failure analysis (see paragraph 2B312), the Agency shall ensure that all associated components are not damaged or otherwise degraded during such operations. The Agency shall:

(1) Advise NASA installation if no delegation or supplemental instruction is received by the Agency.

(2) Ensure that all operations, including testing, are performed in accordance with approved documents.

(3) Provide in-process verification to ensure that all repairs or modifications have been adequately performed and that the affected equipment conforms with applicable requirements.

(4) Witness all tests made necessary by subject effort, including end item acceptance testing, to ensure that the prescribed operational characteristics have been met. Characteristics verified shall be documented.

3. Shortages and Deficiencies. End items with outstanding shortages and deficiencies shall not be released for delivery to the Government or delivery to the procuring supplier without prior written approval of the contracting officer or the procuring contractor, as applicable. Note shortages, deficiencies, and authority for release on DD Form 250 or shipping document.

4. Contractor-Authorized Substitutions. Where the contractor's end item test plan, procedure, or specification does not require approval, the Agency shall evaluate contractor-authorized substitutions of items or procedures to ensure the substitutions are compatible with and conform to contractual requirements. The higher-tier Agency or the NASA QAR shall be notified immediately of questionable substitutions.

5. Modifications After End Item Test and Inspection. Subsequent to end item test and inspection, the occurrence of any modifications, repair, disassembly, or damage resulting from mishandling by the contractor or by the Government shall void previous tests and inspections. The extent of Agency and contractor reinspection and retest shall be as authorized in writing by the cognizant NASA QAR or installation.

2B312 TROUBLE, MALFUNCTION, FAILURE, AND DEFICIENCY FEEDBACK

1. Agency Responsibility. The Agency shall ensure that the contractor's trouble, malfunction, failure, and deficiency feedback system provides for prompt distribution of contractor and NASA generated reports and all related information to the Agency, the delegating Agency, and the NASA QAR. Reports of failed items from site and field failures originating within NASA will be provided by NASA to the prime contractor, the subcontractor where known, and the respective agencies and NASA representatives. When the contractor is required by contract to participate in GIDEP, the Agency shall ensure that the GIDEP

system is implemented. If NASA reports or delegations on failed items returned to a contractor are not received, the Agency shall contact the NASA QAR for information and written direction.

2. Agency Failure Analysis Participation. Agencies shall participate in the examination of items and materials that fail during fabrication and test at contractor plants or are returned from NASA or the prime contractor. The Agency shall perform the following functions:

   a. Prior to the start of analyses, review the contractor's established plan for obtaining an adequate analysis. This plan must include reasonable milestone dates for in-process accomplishment. Delays in preparing the plan or maintaining the established schedule shall be reported to the NASA QAR via telephone and/or TWX.

   b. Inspect all items or materials returned from NASA or the prime contractor (as received and unpacked to verify reported nonconformances and possible physical damages).

   c. Witness physical analysis and tests performed during failure analysis, if appropriate.

   d. Consult with NASA and contractor representatives during failure analysis.

   e. Ensure that NASA installations are provided with samples of failed or deficient items when requested in writing.

   f. Review corrective and preventive actions and comment to the NASA QAR upon their adequacy.

   g. Follow up on all reports to ensure that resulting action is complete and that the troubles, malfunctions, failures, and deficiencies are not repeated.

2B313 PRESERVATION, PACKAGING, PACKING, MARKING, HANDLING, AND SHIPPING

1. Agency Responsibility. On all items to be shipped from the contractor's plant, the Agency shall ensure that:

a. Items are complete and all required fabrication, tests, and inspection have been performed.

b. Inspected items and accompanying documents have been properly identified as to inspection status with appropriate NASA or Agency stamps or Agency-accepted contractor procedures.

c. Required shipping and technical documentation, including approved waivers and deviations, have been provided.

d. All items are in the proper state of assembly and have been preserved, packaged, packed, and marked in accordance with applicable procedures and specifications.

e. Handling devices, environmental control methods, and transportation vehicles are suitable for the items involved and are loaded to prevent damage.

f. The loading and transportation methods conform to applicable specifications and requirements.

g. Applicable safety criteria have been met.

2. Shipping Documents and Data (Documentation) Packages

a. Shipping Documents. The Agency should ensure that the following information is on the shipping document for all shipments: shipping address, contract number, prime contractor's name, purchase order number, subcontractor's name, purchase order line-item number being supplied, part number, quantity, and special marking information when required. Specific authority from NASA, or the prime contractor with the concurrence of the NASA QAR, is necessary to ship supplies with open deficiencies or uncompleted actions. Evidence of approval must be in the data package and must be referenced on all shipping papers.

b. Data Packages. Prior to release of each shipment the data package shall be verified for accuracy and completeness in accordance with contractual requirements.

3. Removal From Shipping Container. When an item which has passed final test and is removed from the shipping container due to an unplanned event, the NASA QAR must be notified.

4. Special Provisions for Critical Items

   a. When NHB 6000.1, "Requirements for Packaging, Handling, and Transportation for Aeronautical and Space Systems, Equipment, and Associated Components," is contractually imposed, the Agency shall ensure that preparation for delivery, application of NASA critical item labels, preparation and processing of packaging, handling, and transportation records (as appropriate and required), and selection of carriers are accomplished as prescribed therein.

   b. When the contract specifies special control of critical items, the Agency shall ensure that items are prepared, packaged, and labeled per the contract for delivery, and that provisions for data packages (history jackets) are met by the contractor.

CHAPTER 4: REVIEW AND EVALUATION OF QUALITY ASSURANCE PROGRAM OR INSPECTION SYSTEM

2B400 QUALITY ASSURANCE PROGRAM OR INSPECTION SYSTEM STATUS

The Agency shall perform an initial review of the documentation which implements the contractor quality program/inspection system to ensure that the documentaton satisfies the requirements of NASA contracts. This initial review is part of the Agency's planning. Previous review or surveys by the Agency on DOD or other NASA contracts should be considered. Unresolved system deficiencies revealed by previous evaluations or surveys on NASA or other contracts having similar quality requirements, including those deficiencies observed from Agency QAR quality assurance activity (see paragraph 2B201-2b), shall be reported to the responsible NASA QAR or delegating Agency as part of the initial status report or QA plan.

2B401 PROCEDURES REVIEW AND EVALUATION

1. Continuous Review and Evaluation. Subsequent to the initial review, the Agency shall continuously review and evaluate the contractor's quality program and inspection system to determine that:

   a. Procedures exist, are adequate, and are fully complied with during all operations requiring control.

   b. Items, processes, and systems exhibit the required degree of quality.

   c. Nonconformances are documented (see paragraph 2B307-6h).

   When reviews, inspections, or tests reveal nonconformance to NASA requirements, the Agency shall require the contractor to effect positive remedial action promptly. Agency records shall include significant events in the contractor's daily activities as revealed by the Agency's observations, dates, and action on procedure approval, results of item and processes review, and other events considered worthy of notation for record purposes or followup action. The Agency shall develop, maintain, and use checklists for its review and evaluation activity. The checklists shall be flexible to permit addition or deletion of topics as necessary.

2. Frequency. Frequency of review and evaluation shall be appropriately adjusted to reflect the results of data and records previously accumulated. Short-term procurements may require an immediate review and evaluation outside the normal frequencies developed over a period of review and evaluation.

3. Criteria. Criteria for review and evaluation shall be explicit, meaningful, sound, and practical. The important factor is the validity of the data contained on contractor records and paperwork and whether the data have been accumulated through strict adherence to applicable written procedures. The mere existence or availability of contractor records or paperwork is not considered adequate review and evaluation criteria. The availability of a certificate of compliance, when authorized, with chemical or physical test data is not in itself satisfactory evidence of compliance unless the chemical or physical test results are checked with the specification requirements and, at established intervals, a sample is selected and checked against the objective evidence contained on the certificate.

4. Establishment of Procedure Evaluations. The Agency shall establish procedure evaluations in accordance with the Agency's standard QA program as modified/ expanded by the delegation and contract requirements.

5. Mandatory Characteristics Requirements. The combination of procedures review and procedures evaluation (particularly in special process control) requires, in addition, the selection of appropriate mandatory characteristics of the item and performance of quality assurance actions to complete proper evaluation.

6. Agency Checklist Updating. Agency checklists for procedures review and evaluation shall be periodically reviewed to ensure compatibility with current contractor procedures.

7. Use of Staff Specialists. Agency staff specialists shall be utilized to assist the Agency QAR in the development of checklists and procedures review and evaluation.

2B402 AGENCY SURVEYS

When the Agency's initial or continuous review identifies contractor quality system deficiencies which are significant, the Agency may determine that a formal survey is needed. In addition, NASA or the delegating Agency may request the lower-tier Agency to perform a survey. If NASA does not provide a survey plan, the Agency shall establish a survey plan, or use existing plans, to ensure all aspects of the contractor's system related to the deficiencies are reviewed and evaluated. The survey plan shall include, as a minimum:

1. Checklists.

2. The number and type of survey team personnel.

3. Areas (functions) to be reviewed, including problem areas requiring special attention and those previously reported deficient.

4. Survey dates.

The Agency shall notify NASA and the delegating Agency of a planned survey, if NASA delegations are involved, during the planning phase of the survey.

2B403 SURVEY REPORTS AND CORRECTIVE ACTION

Upon completion of a survey, the Agency shall prepare a detailed narrative report of findings and recommendations. The Agency shall:

1. Take necessary action to ensure that the deficiencies identified by the survey are corrected and needed improvements are promptly effected.

2. Evaluate the effectiveness of the contractor's corrective actions. This may require a followup survey.

3. Keep the NASA QAR and/or the redelegating Agency informed by:

   a. Copies of survey reports and contractor's corrective action correspondence.

   b. Quality Status Report.

2B404 NASA SURVEYS

1. Contractors. When a NASA installation has advised the Agency that NASA will perform a quality survey, all pertinent contractor quality information known to the Agency shall be discussed with NASA representatives prior to meeting with the contractor's personnel. Such surveys will be chaired by NASA and will involve representatives of the NASA installation and the Agency. After the survey, an Agency-NASA meeting and an Agency-NASA-contractor meeting will be held to discuss the survey results with the contractor's management. The Agency will be informed of conclusions reached by NASA representatives in order that the Agency may take necessary action to ensure that any deficiencies identified by the survey are corrected and needed improvements are promptly effected. The Agency shall evaluate the effectiveness of the contractor's corrective actions and keep the cognizant NASA installation informed.

2. Agency. NASA may review the Agency implementation of the NASA delegation(s) in conjunction with a survey at the contractor location or as otherwise scheduled. Agency staff specialists may support NASA in the survey. Either NASA or the Agency's next higher level of management shall provide followup for required corrective action.

2B405 CONFIGURATION AND CHANGE CONTROL MANAGEMENT

1. The Agency shall continuously review and evaluate the contractor's documented configuration and change management system when one is required by the procurement. The contractor shall not be permitted to release or otherwise incorporate changes that violate these procedures. NASA or the Agency, when so delegated, may authorize limited on-the-spot changes, such as redlining of drawings. In some instances, contractor personnel may be authorized to initiate on-the-spot changes for items under contractor design control. The Agency shall ensure that changes are promptly and formally documented in accordance with the established procedures prior to shipping.

2. The contractor's system shall ensure that items affected by engineering changes shall be scrapped, modified, reworked, repaired, or otherwise disposed of in a timely manner to preclude delivery or use of material or items of incorrect configuration.

2B406 STORES CONTROL

The Agency shall review and evaluate the effectiveness of the contractor's control of materials and items in store rooms and large assemblies or items not confined to store rooms for various valid reasons. The Agency shall ensure that the contractor's system of stores control provides effective protection for materials and items subject to shelf life, quality deterioration, loss of identification or damage due to:

1. Exposure to adverse environmental conditions.

2. Handling.

3. Packaging.

4. Stocking and distribution practices.

5. Engineering changes.

6. Modification, rework, and repair.

7. Configuration changes.

8. Time.

2B407 SOFTWARE QUALITY ASSURANCE

1. General

   a. The growth of computer software procurements has added another dimension to the present quality assurance actions. This part provides the Agency with guidance for ensuring the quality assurance actions applied to software items will ensure conformance to contract requirements. Because of the complex nature of some of these items, the Agency quality assurance representatives are encouraged to solicit technical specialists support in carrying out the quality assurance function.

   b. Computer software is a product consisting primarily of symbolic data with product configuration reflected solely in its documentation. Because of its specialized nature, there may be situations wherein NASA and the Agency may not be in complete accord as to what constitutes the

normal quality assurance functions. In addition to witnessing and monitoring tests, Agency actions will usually be limited to the reviewing, monitoring, and evaluation of the contractor's computer software planning documents, management practices, and related procedures for quality control of the software development effort. By ensuring conformance with the plans, that documented procedures exist and are being adhered to, and by ensuring effective quality management over contractor's software development effort, the quality of the software product is influenced. Testing is an equally important part of the software development effort, although it does not directly influence the as-built quality of the software product. Testing identifies the design and coding errors that would degrade quality if permitted to go undetected without corrections. The Agency shall perform the functions prescribed in this handbook to the extent necessary to determine contract conformance.

2. Agency Responsibilities

   a. Review software management plan.

   b. Review software quality assurance plan.

   c. Review the software configuration management plan.

   d. Review software development plan.

   e. Review software verification validation plan.

   f. Review the technical specification.

   g. Review test plans and test and evaluation reports.

   h. Ensure adequacy of software configuration management control board procedures.

   i. Ensure adequacy of software library controls.

   j. Ensure conformance to approved software plans.

   k. Ensure flow down of requirements to subcontractors.

1. Monitor: (1) the requirements development process to ensure that all system requirements are allocated to software or hardware, are expressed in testable terms, and are identified as functional, interface, or performance; (2) the design process to ensure that design standards are followed; ensure all software requirements are allocated to software elements; ensure that results of design inspections and reviews are included in approved design revisions; and (3) the implementation process to ensure that coding standards are being followed. Audit the control mechanisms for code, such as unit development folders and program library to ensure that approved procedures are followed and reported status is correct.

3. Procedures Evaluation. All contractors procedures for controlling software will be continuously reviewed by the Agency.

CHAPTER 5: CHANNELS OF COMMUNICATION

2B500 COMMUNICATIONS WITH NASA

Correspondence and other communications shall be addressed as designated in the letter of delegation or as directed by the NASA contracting officer. The NASA QAR shall be the point of contact concerning delegated quality assurance functions. Direct liaison is necessary on quality assurance technical matters between Agency representatives and the NASA representative(s).

2B501 COMMUNICATIONS WITH CONTRACTORS

The Agency shall communicate directly with the contractor when performing delegated functions. Copies of Agency correspondence shall be provided to the NASA QAR. NASA communications with the contractor concerning delegated functions will be made through or simultaneously with the Agency.

2B502 INTERAGENCY COMMUNICATIONS

When functions have been redelegated, the redelegating Agency shall communicate directly with the lower-tier Agency in matters associated with the quality of supplied items. Examples of such matters are unsatisfactory or marginal receiving results, system or end item failures attributable to supplied items, and other applicable matters which may become known from contractor or NASA sources.

2B503 IDENTIFICATION OF PROCURING NASA INSTALLATION

Appendix B lists prefix symbols identifying NASA contracts and purchase orders with the procuring NASA installation as set forth in the Federal Acquisition Regulation Supplement (NASA/FAR Supplement, NHB 5100.4).

APPENDIX A: GLOSSARY OF TERMS AND ACRONYMS

The following terms apply to this publication:

Acceptable Quality Control System. A contractor's quality control system that complies with the requirements of the contract and demonstrates by operating practice a continuous ability to conform to an established system. (Source: Defense Logistics Agency Manual (DLAM) 8200.1.)

Acceptability Criteria. A limit or limits placed upon the degree of nonconformance permitted in material expressed in definitive operational terms. (Source: Military Standard (MIL-STD) 109B.)

Acceptance. The act of an authorized representative of the Government by which the Government assumes for itself, or as an agent of another ownership of existing and identified suppliers tendered, or approves specific services rendered as partial or complete performance of the contract on the part of the contractor. (Source: Federal Acquistion Regulation (FAR) 46-101.)

Agency. An element of the U.S. Government, a NASA installation, an element of the Department of Defense (DLA, USAF, USN) acting as an agent on behalf of NASA to perform quality assurance functions.

Analysis (Nonconformance). The study of a specific nonconformance, such as a failure, in order to determine the causes and to arrive at a course of remedial and preventive action. (Source: NHB 5300.4(1B).)

Article. A unit of hardware or any portion thereof required by the contract. (Source: NHB 5300.4(1B), see Item, Material, and Unit.)

Calibration. Comparison of a measurement standard or instrument of known accuracy with another standard or instrument to detect, correlate, report, or eliminate by adjustment, any variation in the accuracy of the item being compared. (Source: MIL-STD-45662.)

Certificate of Conformance. A contractor's written statement, when authorized by contract, certifying that supplies or services comply with contract requirements. (Source: FAR 46-504.)

Certified Personnel. Personnel for which required training has been completed and specified knowledge and/or proficiency has been demonstrated. (Source: NHB 5300.4(1B).)

Certification (Process). A written statement based on objective quality evidence that a process conforms to specified requirements. (Source: NHB 5300.4(1B).)

Certification Testing. Certification tests consist of the subsystem qualification tests and the subsystem higher-level-of-assembly tests, plus vehicle level tests. Certification testing does not include exploratory, design verification, development, prequalification, piece-part qualification, acceptance or check-out test, except where such tests are required for certification. (Source: NHB 5300.4(1B).)

Characteristic. A physical, chemical, visual, functional or any other identifiable property of a product of material. (Source: MIL-STD-109B.)

Characteristic (Mandatory). A characteristic selected by the Agency or NASA from a contractor's operation, which, if defective or inadequately accomplished, could prevent the article from performing its intended purpose in the next higher assembly or as an end item, or result in hazardous or unsafe conditions when fabricating, inspecting, testing, using, or maintaining the article. (Source: NHB 5300.4(2B).)

Color Vision. Ability to distinguish red, green, blue, and yellow colors as prescribed in Drovine Charts, Ishigara Plates, or AOD-HRR Tests. (Source: DLAM 8200.1.)

Component. A part, assembly, or combination of parts subassemblies or assemblies mounted together to perform a design function.

Contract. The prime contract executed by the Government and the prime contractor which, in addition to the terms and conditions thereof, includes, by reference or otherwise, specifications, drawings, exhibits, and other data necessary to its proper performance. (Source: NHB 5300.4(1B).)

Contract Quality Requirements. The detailed requisites for quality incumbent on the contractor, consisting of all quality requirements contained in a contract, and the detailed contractual requisites provided by the contract incumbent on the contractor to substantiate conformance of product or service to quality requirements of the contract. (Source: FAR 46-101.)

Contract Schedule. That portion of a Government prime contract which describes the articles or services desired for that particular contract. Not to be confused with contract time-schedule or delivery schedule. (Source: NHB 5300.4(1B).)

Contracting Officer. Any Government employee who is currently designated a contracting officer with the authority to enter into and administer contracts and make determinations and findings with respect thereto, or with any part of such authority. The term also includes the authorized representative of the contracting officer acting within the limits of his/her authority. (Source: NHB 5300.4(2B).)

Contractor. The individual(s) or concern(s) who enter into a prime contract with the Government. (Source: NHB 5300.4(1B).)

Contractor-Acquired Property. Property procured or otherwise provided by the contractor for the performance of a contract, title to which is vested in the Government. (Source: NHB 5300.4(1B).)

Contractor Data. Contractor records of inspections and tests developed as a result of contractual requirements. These data also include records maintained to control various processes, records or repair and rework, records attesting to the quality of supplies obtained from subcontractors, and contractors' reports of investigations and corrective action. (Source: DLAM 8200.1.)

Contractor's Quality Control System. The contractor's overall quality program or inspection system, including inspections and tests necessary to substantiate product conformance to drawings, specifications, contract requirements, and to all inspection and tests required by the contracts. These requirements are to include contractor personnel making decisions as to acceptability of product and control of procedures and processes.

Date Code. A symbol which indicates a specific date in code. A date code may consist of a series of numbers or letters that indicate day, week, month, or year. (Source: NHB 5300.4(1B).)

Defect. Any nonconformance of the unit of product with specified requirements. (Source: MIL-STD-105D.)

Degradation. A gradual impairment in ability to perform. (Source: MIL-STD-721C.)

Delivery. The physical transfer of possession. The contract specifies the point and time at which delivery takes place. See Acceptance. (Source: NHB 5300.4(1B)).

Deviation. A specific written authorization, granted prior to the manufacture of an item, to depart from a particular performance or design requirement of a specification, drawing,or other document for a specific number of units or a specific period of time. A deviation differs from an engineering change in that an approved engineering change requires corresponding revision of the documentation defining the affected item, whereas a deviation does not contemplate revision of the applicable specification or drawing. (Source: DOD-STD-480A.)

DOD. Department of Defense.

Effectivity. The point at which an action occurs to produce a desired result. (Source: NHB 5300.4(1B).)

End Item. Any item defined in the contract as deliverable to the Government or to a contractor as Government-furnished property.

Failure. The event, or inoperable state, in which any item or part of an item does not, or would not, perform as previously specified. (Source: MIL-STD-721C.)

Failure Analysis. Subsequent to a failure, the logical systematic examination of an item, its construction, application, and documentation to identify the failure mode and determine the failure mechanism and its basic course. (Source: MIL-STD-721C.)

Failure Mode and Effects Analysis. A procedure by which each potential failure mode in a system is analyzed to determine the results or effects thereof on the system and to classify each potential failure mode according to its severity. (Source: MIL-STD-721C.)

Flight Hardware. Hardware designed and fabricated for use in flight projects, i.e., aeronautical and space. See Protoflight Hardware.

Functionally Critical Hardware. The part, component, subsystem, or system whose failure to function would affect crew safety, mission success, or project goals without regard to redundancy, backup modes, or alternate modes of operation.

Functional Test. A test performed to demonstrate that the article operates as required. (Source: NHB 5300.4(1B).)

GCQA. Government Contract Quality Assurance. All of the necessary tasks to ensure that a contractor or supplier complies with contractual quality assurance requirements.

Government-Furnished Property. Property in the possession of, or acquired directly by the Government and subsequently delivered or otherwise made available to the contractor. (Source: NHB 5300.4(1B).)

Government Property. All property owned by or leased to the Government or acquired by the Government under the terms of a contract. Government property includes both Government-furnished property and contractor-acquired property. (Source: NHB 5300.4(1B).)

Ground Support Equipment. Equipment used to store, transport, handle, test, checkout, service, and control aircraft, launch vehicles, and spacecraft. Also, equipment used to communicate with and to monitor operational aircraft and spacecraft. This includes equipment for ground tests whether or not operational during flight operations.

In-Process Inspection. Inspection which is performed during the manufacturing or repair cycle in an effort to prevent defects from occurring and to inspect the characteristics and attribution which are not capable of being inspected at final inspection. (Source: MIL-STD-109B.)

Inspection. The examination and testing of supplies and services (including, when appropriate, raw materials, components, and intermediate assemblies) to determine whether they conform to specified requirements. (Source: FAR 46-101.)

Item. A nonspecific term used to denote any product, including systems, materials, parts, subassemblies, sets, and accessories. (Source: MIL-STD-280.)

Material Review Board. The formal contractor-Government board established for the purpose of reviewing, evaluating, and disposing of specific nonconforming supplies or services, and for ensuring the initiation and accomplishment of corrective action to preclude recurrence. (Source: MIL-STD-109B.)

Measuring and Test Equipment. All devices used to measure, gage, test, inspect, or otherwise examine items to determine compliance with specifications. (Source: MIL-STD-45662.)

MRB. Material Review Board.

NASA Installation. This term includes NASA Headquarters and field installations.

NASA Quality Assurance Representative (NASA QAR). A NASA employee designated to perform quality assurance functions, who may be stationed at either a NASA installation, a NASA area office, the supplier's plant, or another Government agency as NASA liaison representative. (Source: NHB 5300.4(2B).)

NASA Designated Representative. A representative of the NASA installation stationed at the supplier's plant or a representative of the Agency to whom quality assurance functions have been delegated. (Source: NHB 5300.4(2B).)

NHB. NASA Handbook.

Nonconformance. The failure of a unit or product to conform to specified requirements for any quality characteristic. (Source: DOD Handbook H53.)

Objective Quality Evidence. Any statement of fact, either quantitative or qualitative, pertaining to the quality of a product or service based on observations, measurements, or tests which can be verified. (Evidence will be expressed in terms of specific quality requirements or characteristics. The characteristics are identified in drawings, specifications, and other documents which describe the item, process, or procedure.) (Source: MIL-STD-109B.)

Off-the-Shelf-Item. An item produced and placed in stock by a contractor prior to the contractor receiving orders or contracts for the sale of the item. The contractor may produce the items to either commercial or military/Federal item specifications or descriptions. Includes items stocked by distributors for which Government controls may be received.

Part. One piece, or two or more pieces joined together which are not normally subject to disassembly without destruction of designed use. (Examples: outer front wheel bearing of 3/4 ton truck, electron tube, composition resistor, screw, gear, mica capacitor, audio transformer, milling cutter.) (Source: MIL-STD-280A.)

Payload. The elements of hardware that are assembled as an entity for Space Transportation System (STS) transportation to space and operations in space. It may be a spacecraft or an attached payload. It may include support equipment aboard the STS and an associated boost element such as the Inertial Upper Stage (IUS).

Protoflight Hardware. Payload equipment intended for flight and subject to a verification program to demonstrate satisfactory design, materials, parts, processes, fabrication, workmanship, and performance by exposure to environments more severe than expected during the mission but not so as to induce unrealistic failure modes or to consume an excessive portion of the useful life of the equipment.

QAR. Quality Assurance Representative.

Qualification. Determination that an article or material is capable of meeting all prescribed design requirements.

Qualified Products List (QPL). A list of products, qualified under the requirements stated in the applicable specification, including appropriate product identification and test reference with the name and plant address of the manufacturer or distributor, as applicable. (Source: DOD Standardization Manual 4120.3-M.)

Quality Assurance. A planned and systematic pattern of all actions necessary to provide adequate confidence that the item or product conforms to established technical requirements. (Source: DLAM 8200.1.)

Quality Control. A management function whereby control of quality of raw or produced material is exercised for the purpose of preventing production of defective material. (Source: MIL-STD-109B.)

R&QA. Reliability and Quality Assurance.

Reliability. (1) The duration or probability of failure-free performance under stated conditions. (2) The probability that an item can perform its intended function for a specified interval under stated conditions. (For nonredundant items this is equivalent to definition (1). For redundant items, this is equivalent to definition of mission reliability.) (Source: MIL-STD-721C.)

Repaired Material. Nonconforming material subjected to a process designed to reduce but not completely eliminate the nonconformance. (Source: MIL-STD-1520.)

Request for Waiver. The formal document prepared by the contractor, or subcontractors, and submitted by the prime contractor to the Government for the purpose of requesting acceptance of the designated nonconforming supplies or services, or for requesting temporary relief from a technical requirement of the contract. (Source: DLAM 8200.1.)

Reworked Material. Material that was nonconforming but has been subjected to a process that restores all nonconforming characteristics to the requirements in the contract, specification, drawing, or other approved product design. (Source: DLAM 8200.1.)

SCD. Specification Control Drawing.

Software. A body of instructions, commands, and data needed to cause a computer to execute desired functions. Software may be either deliverable or nondeliverable and may be used to control and operate such items as missile systems, spacecraft, satellites, automated test equipment, and numerally controlled equipment. (Source: DLAM 8200.1.)

Source Agency. Agency at the plant of the actual producer of the purchased articles. (Source: NHB 5300.4(2B).)

Subcontract. Any contract, other than a prime contract, entered into by a prime contractor or subcontractor calling for supplies or services required for the performance of any one or more prime contracts. (Source: FAR 46-101.)

Subcontractor. Any supplier, distributor, vendor or firm which furnishes supplies or services to or for a prime contractor or another subcontractor. (Source: FAR 46-103.)

Survey. A review and evaluation to determine the adequacy of the technical requirements relating to quality and product conformance to design intent. (Source: FAR 46-103.)

System. A composite of equipment, skills, and techniques capable of performing or supporting an operational role, or both. A complete system includes all equipment, related facilities, material, software, services, and personnel required for its operation and support to the degree that it can be considered a self-sufficient unit in its intended operational environment. (Example: Dew Line.) (Source: MIL-STD-280A.)

Testing. An element of inspection and generally denotes the determination by technical means of properties or elements of supplies or components thereof, including functional operation, and involves the application of established scientific principles and procedures. (Source: FAR 46-101.)

Traceability. The ability to relate individual measurement results to national standards or nationally accepted measurement systems through an unbroken chain of comparisons. The ability to trace raw material or piece parts usage from the first stage of use to end-item use and the reverse. Necessary to identify potential defects resulting from known generic problems. (Source: MIL-STD-280A.)

Training. Instruction to develop or maintain an individual's proficiency or skill and/or to impart specific knowledge. (Source: NHB 5300.4(2B).)

Visual Acuity. Keenness of perception and sharpness of vision: (a) Far vision, Snellen Chart, 20/50. (b) Near vision, Jaeger 1 at 14 inches or reduced Snellen, 20/20 or equivalent. (Source DLAM 8200.1.)

Waiver. A written authorization to accept a configuration item or other designated items which, during production or after having been submitted for inspection, are found to depart from specified requirements, but nevertheless are considered suitable for "use as is" or after rework by an approved method. (Source: MIL-STD-480.)

APPENDIX B: IDENTIFICATION OF PROCURING NASA INSTALLATIONS

To facilitate identification of procuring NASA installations for NASA contracts and purchase orders, the following list of NASA installations/offices and corresponding prefix symbols:

NASA INSTALLATION/OFFICE	CONTRACT SYMBOL	PURCHASE ORDER SYMBOL	MAIL ADDRESS
For Headquarters Basic Agreements and Institutional Cost Sharing Agreements	NAS11-		National Aeronautics and Space Administation Office of Procurement Washington, DC 20546
For All Other NASA Headquarters Contracts	NASW-	W-	National Aeronautics and Space Administration Office of Procurement, Contracts and Grants Division Washington, DC 20546
Langley Research Center	NAS1-	L-	National Aeronautics and Space Administration Langley Research Center Hampton, VA 23665
Ames Research Center	NAS2-	A-	National Aeronautics and Space Administration Ames Research Center Moffett Field, CA 94035
Lewis Research Center	NAS3-	C-	National Aeronautics and Space Administration Lewis Research Center 21000 Brookpark Road Cleveland, OH 44135

Dryden Flight Research Facility	NAS4-	E-	National Aeronautics and Space Administration Dryden Flight Research Facility P. O. Box 273 Edwards, CA 93523
Goddard Space Flight Center	NAS5-	S-	National Aeronautics and Space Administration Goddard Space Flight Center Greenbelt, MD 20771
Wallops Flight Facility	NAS6-	P-	National Aeronautics and Space Administration Goddard Space Flight Center Wallops Flight Facility Wallops Island, VA 23337
NASA Resident Office-JPL	NAS7-	WO-	NASA Resident Office-JPL 4800 Oak Grove Drive Pasadena, CA 91109
George C. Marshall Space Flight Center	NAS8-	H-	National Aeronautics and Space Administration George C. Marshall Space Flight Center Marshall Space Flight Center, AL 35812
Lyndon B. Johnson Space Center	NAS9-	T-	National Aeronautics and Space Administration Lyndon B. Johnson Space Center Houston, TX 77058

John F. Kennedy Space Center	NAS10-	CC-	National Aeronautics and Space Administration John F. Kennedy Space Center Kennedy Space Center, FL 32899
National Space Technology Laboratories	NAS13-	NS-	National Aeronautics and Space Administration National Space Technology Laboratories NSTL Station, MS 39529

APPENDIX C: SAMPLE TYPICAL AGENCY PERIODIC QUALITY STATUS REPORT

AGENCY: DCASMA - Newark, NJ

PRIME CONTRACT: NAS7-150

PERIOD COVERED: March 1, 1984 - April 1, 1984

SUBCONTRACT: SC-0521 or N/A

REPORT #84-6: Year #

PURCHASE ORDER: P05269 or N/A

DATE: April 5, 1984

SUPPLIER: Dale Manufacturing Company

ARTICLE OR SYSTEM: Galileo-LOX System "Mission Essential."

ADDRESS: Hillside, NJ

The following information is provided in accordance with NHB 5300.4(2B-1), paragraph 2B205-2b, and supplemented by the delegation letters. This paragraph should include followup and additional information on previously reported noncompliances to the quality system requirements. This information should be reported each month until the problems have been satisfactorily resolved.

1. Nonconformance or Inadequate Compliance

   a. It is the intent of this paragraph to report system and procedural deficiencies of the contractual quality program or inspection system requirements.

      Example: The supplier does not comply with NHB 5300.4(1B):

      (1) Chapter 9 (Metrology Controls). Instruments proposed for use during qualification tests of the LOX System were not currently calibrated and lacked evidence of compatibility with prime contractor established requirements, (NAA-16723). Quality deficiency report was issued to Dale Manufacturing Company management. Supplier has taken necessary corrective action and followup by DCAS-QAR completed. NASA/Resident Office Representative advised and compatibility requirements arranged between NASA and Dale. One week delay of qualification test resulted as reported by DCAS Failure Report TWX 000762. Delivery schedule of system not affected as reported.

(2) Chapter 5, paragraph 1B502 (Procurement Documents). In reviewing procurement documents, it was noted that the supplier did not include the quality specifications in the purchase orders of several items of raw materials and electrical components. This nonconformance was brought to the attention of responsible personnel, who issued procedures to ensure that the purchase order would include the quality specifications.

(3) This month's procedures review and evaluation of the supplier system revealed two nonconformances in the areas of in-process fabrication controls, engineering changes, receiving inspection, and shipping departments.

b. Audit conducted March 6-10, 1984, by prime contractor. Awaiting report from NASA Resident Office Representative.

2. Changes in Supplier's Quality Assurance Program or Inspection System. This section shall contain a narrative description of all changes in the supplier's quality assurance program or inspection system affecting the level of inspection or testing performed by the supplier and/or the inspection agency.

Example: The supplier has completed all system and procedure actions required by the February 1984 NASA-JSC survey recommendations. Action is being taken by Dale Manufacturing Company management to include changes in the Quality System Manual to correct the system deficiencies reported in subparagraphs 1(a) and (2).

Example: The contractor initiated a change in the sequence of assembly of the adapter; therefore, X-ray tests, now performed at Station No. 12, must be performed at Station No. 14. This will cause difficulty in the inspection of the welds at this station. It will, however, improve assembly operations to an appreciable extent which will outweigh the difficulties incurred in inspection. A procedure for accomplishing the required inspection is presently being prepared by the supplier.

3. Changes in or Departure from the Agency Quality Assurance Plan. This section shall contain a narrative description of all changes in the Agency quality assurance plan.

Example: Amendment Number 5 of the Agency quality assurance plan is submitted as follows: In order to clarify inspection results and statistical information originating in the electronic assembly area (Instruction Point 22A), inspection of modules and printed circuit boards fabricated in that area will be reported separately under Inspection Point 21C. Control Point 22D will be utilized for the purpose of reporting inspection of final electronic assemblies only. The Agency inspection/test plan will be modified by (Date).

Example: During this reporting period, it was necessary to deviate from the Agency quality assurance plan. The nonconformance to the plan was caused by illness of the two inspectors who normally cover the center section assembly area. During the absence of the inspectors, arrangements were made with the supervisor of each shift concerned to furnish a well-trained and capable individual to perform the required inspection functions. This situation will be eliminated in the future since additional inspection agency personnel have been made available to compensate for problems of this type and are now on board.

4. Summary of Article Inspected and Tested. This section contains a summary of Agency inspection and test results for the reporting period. Identification of articles, percent rejected, description, and corrective action shall be indicated for problem areas on critical articles. The Agency shall submit:

   a. Total number mandatory characteristics planned for each article or system.

   b. Total number mandatory characteristics actually inspected for the reporting period. (Note: Explain any difference between subparagraphs 4 (a) and (b) totals.)

   c. List the percentage of the total number of "Other than Mandatory" characteristics applicable to NASA observed during the reporting period.

   d. Total MRB actions in which agency participated during reporting period and what percentage was initiated by agency action.

   e. Summary of agency actions taken regarding corrective action followup on previous failure reports.

This paragraph should include followup and additional information on previously reported failures and nonconformances. This information should be reported each month until the resolution of these problems has been found acceptable.

5. Unauthorized Use of Advance or Disapproved Documents. This section shall contain information that indicates the agency constantly ensures that drawings, specifications, procedures, and other quality documentation used by the contractor in producing, testing, and accepting detail parts and end articles are current, approved, and properly applied. Any deficiencies should be reported.

   Example: A preliminary specification covering hi-pot acceptance test of new transformer was in receiving inspection. Use of an out-of-date detail drawing was corrected by addition of the proper engineering change order. A survey was performed of three assembly areas involving 67 prints and no additional discrepancies were revealed.

6. Agency Comments on Supplier or Government Initiated Corrective Action. (Waivers and Deviations) This section shall contain comments on approved waivers and deviations which may result or have resulted in unsatisfactory quality, reduced performance, or lowered reliability.

   Example:

   (a) NASA Specification 107, Weld Repair for 105-Inch Diameter Aluminum Alloy Tanks, permits two repairs per seam weld not to exceed 6 inches in length. The tank was rejected by personnel of this office; however, the contractor obtained a contractual waiver (No. 3-6, dated February 21, 1984), contract NAS 7-150 from John H. Doe, Contracting Officer. In the opinion of this office, the waiver has authorized a condition which could possibly result in failure of the tank when pressure is applied.

   (b) Contracting Officer approval of Dale Manufacturing Company request for waiver of approved welding procedure (NAA-17682) (weld pass sequence) will affect final dimensions of tank assembly. Please reassess and advise per telephone conversation request of March 1, 1984. No reply received with decision on request. Urgent; could affect program schedule.

(c) Waiver of vibration test by JSC technical representative (Date) finished assembly part - NAA-16872 not appropriate. Later review after visit indicates structural problems may develop due to configuration of bracket part #17692.

7. Workforce Status. This section shall contain the total number of regular and overtime staff hours expended during the reporting period.

Example: The Agency had four persons assigned the contract full time and two assigned part time.

John Jones, NASA STAMP (M-4A2), transfer pending. Agency arranging for replacement by equally competent QAR with necessary nondestructive test experience and background. Orderly transfer will be accomplished without loss of mandatory characteristic coverage at appropriate inspection stations.

Regular Quality Assurance Time Charged 724 hours
Quality Assurance Overtime Charged 52 hours
Engineering and Staff Specialists 20 hours

8. Projected Agency Workforce Requirements. Agency planning should include such change in demands for personnel as those resulting from change to production rates. Required increases or decreases in Agency personnel shall be reported for the ensuing 3 months.

Example: Increase in activity in module assembly will require an additional electric inspector, Grade GS-9, by June 1. A requisition for same has been filed and approved. The billet will be occupied by the required date by a qualified inspector. This addition to the staff on this order will increase our applied workforce to five full-time inspectors and two assigned part time.

9. Unresolved Outstanding Problems. Technical or administrative problems with the contractor, supplier, or the Agency which remain unresolved since last reported should be described.

Example: Difficulties in producing consistently acceptable plastic sleeves reported February 1, 1984, are still evident at the vendor, Smith and Jones Company. Thirty-two percent of delivered assemblies were rejected this report period. The contractor's plastic processing specialists have been assigned to assist the vendor.

As per our telephone conversation March 20, 1984, requested NASA Resident Office assistance in resolving (supplier's name) process specification on resistance welding (46723-N2). A copy was forwarded to NASA Resident Office March 21, 1984. This is still an open item and should be resolved by April 15, 1984, as the present schedule requires assemblies to be processed by this method on that date. In addition to noted problems described above (see paragraph 6), request expeditious action by NASA Resident Office. Late reply will affect delivery schedule with possibility of rework and requalification testing.

10. Progress in Completing Training. Specialist training of Agency personnel should be reported until all anticipated certifications have been accomplished. Upgrading and refresher courses should also be similarly reported.

    Example: Inspectors Brown and Green have completed training in magnetic particle inspection and X-ray weld inspection, respectively. Three other inspectors are scheduled for the magnetic particle inspection training during the period June-August at Watertown, Massachusetts.

11. Critical/Special Process Review. The following processes were reviewed and discrepancies as noted:

    (a) Radiographic Inspection. Operator visual examination had expired, no impact.

    (b) Crimping. No deficiencies.

    (c) Dip Brazing. Temperature not properly controlled during a 2-day period; no NASA parts brazed during that period.

12. Narrative Overall Evaluation of the Contract. This narrative shall contain the Agency representative's evaluation and opinion, based on the previous month's observations, of the overall effectiveness of the supplier's quality program. The subjects to be discussed should be:

    (a) The supplier's management of the quality.

    (b) The overall effectiveness of the supplier's quality system and procedures.

(c) The overall quality of the product.

(d) The overall effectiveness of the supplier's corrective action system.

(e) The effectiveness of the prime contractor's quality representative assigned to supplier's plant.

(f) Corrective action by supplier on survey or audit recommendations of prime contract.